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INDEX TO VOLUME V.

The asterisk (*) denotes that the subject is illustrated.

- Abelia rupestris*.....329, 520
 serrata.....182
Abies balsamea, var.....274
 concolor.....274
Abutilon variegated, Eclipse.....116
 venillarium igneum.....428
Acacia dealbata.....341
 decurrens.....262
 Drummondii.....154
 Farnesiana.....580
 fragrans.....615
 melanoxylo.....263
 mollissima.....178
 Nemu.....15, 254
 pycnantha.....262
Acalypha tricolor.....536
Acampe Madagascariensis.....4
Acanthopanax ricinifolia.....183
Achillea Mongolica.....300
 the Pearl.....394
Aconitum autumnale.....464
Actinidia polygama.....320, 555
Ada Lehmanni.....30
Adiantum assimile.....308
 Capillus-Veneris imbricatum.....552
 magnificum.....464
 cuneatum grandiceps.....308
Adlumia cirrhosa.....297
Adonis vernalis.....236
Aërides Augustianum.....462
 Lawrenciæ Amesianum.....30
Æschynanthi, cultivation of.....558
Æsculus parviflora.....360
Agapanthus umbellatus.....460
Agricultural colleges, botany in.....593
Agriculture, Massachusetts Society for promoting.....371
Agrostis alba.....618
Ailanthus flavescens.....543
Alabama, mountain flora of.....597
Alaska, berries in.....384
Albemarle Pippin.....24
Alberta magna.....40
Allamanda cathartica.....428
 Hendersonii.....428
 nobilis.....162
 Schottii.....162, 428
 Williamsii.....40
Allen, C. L., article by.....501
Allium cernuum.....412
Almonds, flowering.....232
 in California.....351
Alphand, death of.....24
 monument to.....564
Alpinia nutans.....585
Alstroemeria aurantiaca.....354
 pelegriana alba.....512
Alternanthera, Leaf-blight of.....56
Althea ficifolia.....303
Alvord, Wm., paper by.....213, 237
Alyssum repens.....588
 saxatile.....236
Amaryllis Belladonna Kewense.....512
Amelanchier alnifolia.....493*
 Canadensis.....220
America, a foreigner's impressions of.....298, 309, 321
Amorphophallus Rivieri.....185
Ampelopsis quinquefolia.....400
 tricuspidata.....182
Anastatica hierochuntica.....506
André, Ed., paper by.....244
Andromeda Japonica.....543
Anemone blanda.....212
 robusta.....212
 Hepatica.....282
 Japonica.....92, 441, 620
 alba.....464
 Pennsylvanica.....295
 ranunculoides.....236
 Robinsoniana.....270, 284
 sylvestris.....260
 the Wind.....220
Angræcum fragrans.....30, 480
Annapolis, homes and gardens of.....599
Annals, garden.....488
 little-known.....416
Anthericum Liliastrum.....307
Anthracoze in bean-seeds.....18
 of the pear.....501
Anthurium Greyanum.....526
 Scherzerianum.....587
Aphelandra aurantiaca.....31
Apios tuberosa.....615
Appendicula Peyeriana.....76
Apple, Arkansas Black.....11
 Bailey Sweet.....11
 Cogswell.....11
 Fameuse.....176
 Ontario.....504
 Pelouse.....11
 Princess Louise.....11
 stocks, hardy.....16
Apple-leaf blight.....490, 526
Apples, Canadian.....176
 cider.....552
 cultivation in Kansas.....622
 in North Carolina.....48
 in the north-west.....131
 late-keeping.....80
 new.....180
 rare varieties of.....11
 scab-proof.....442, 467, 489, 514
 top-grafting.....558
Aquatic garden at Clifton, N. J. 310, 494*
 plant, a new.....280
 plants at Farview, Staten Island.....82
 cultivation of.....177, 283, 320, 332, 354, 404, 418, 439, 441, 477
 in California.....611
 in Central Park.....456
 in southern New Jersey.....363
 winter-flowering.....44
Aquilegia Canadensis.....272, 300
 chrysantha.....296
 Stuartii.....248
Arachnanthe Cathcartii.....153
Aralia Sieboldii.....596
Araucaria excelsa.....215
 imbricata.....82, 603
Arbor day.....169
Arboretum at Kew.....602
Arbutus Menziesii.....146, 238
 trailing, transplanting the.....202
Architects' gardens.....467
Architecture of gardens and green-houses.....612
Arctium Lappa Japonicum.....419
Ardisia crenulata.....165, 596
Aristolochia Gigas.....510
 Sturtevantii.....40, 400
 grandiflora.....510
 Serpentaria.....376
 Sipho.....509*
 tomentosa.....509
Armeria vulgaris.....332
Armeria, cultivation of.....9
Arnica nudicaulis.....220
Arnold Arboretum, notes from.....225, 249, 255, 282, 294, 318, 330, 343, 353, 367, 390, 402, 426, 571, 578, 580
 the.....27
Artemisia vallesiaca.....160
Asarum Virginicum.....110
Asclepias tuberosa.....402
Ascyrum Crux-Andree.....256*, 287
Ash, American, species of.....286
Asparagus plumosus.....43
 tenuissimus.....43
Aspidistra elatior.....596
Asplenium montanum.....117, 521
Aster alpinus.....308
 amellus.....521
 amethystinus.....377*
 Candelabra.....417
 corymbosus.....404
 diplostephioides.....521
 Herveyi.....404
 laevis.....521
 Lindleyanus.....404
 longifolius.....521
 macrophyllus.....404
 Novæ-Angliæ.....404
 Novi-Belgii.....404
 oblongifolius.....520
 paniculatus.....521
 ptarmicoides.....404
 sericeus.....472*
 Stracheyi.....521
 surculosus.....520*
Aster, Thomsoni.....521
Astericus pygmaeus.....506
Asters in English gardens.....520
 perennial.....453
Astragalus.....172
 Monspessulanus.....332
Athyrium Goringianum pictum.....464
Aubrietia Leichtlini.....272
Aubrietias, cultivation of.....272
Audubon, monument to.....528
Auriculas, cultivation of.....9, 211, 212
Australian plants in Kew.....222
Autumn-blooming perennial plants.....464
 foliage.....70, 603
 work in the garden.....441
Ayres, H. B., papers by.....297, 345
Azalea calyciflora.....150
 cuttings.....320
 Indica.....186
 Hexe.....408
Azaleas at Knap Hill.....305

B

- Baccharis halmifolia*.....154
 pilularis.....323
Bachelor's Button.....272
Bailey, Colonel, papers by.....356, 369
 Prof. L. H., articles by.....90, 310, 346, 398, 423, 442, 458, 470, 490, 514, 526, 587
 papers by.....2, 38, 50, 495, 518
Balamaacanda Chinensis.....440
Balsam, Large-cone.....274
Bamboo sheeting.....396
Bamboos, Japanese.....368
 garden.....174
Barberry, the Texas.....580, 611
Bark and bark products.....468
 beetles.....396
Barker, M., articles by.....8, 31, 92, 128, 162, 165, 272, 273, 284, 295, 298, 403, 415, 428, 491, 500, 523, 525, 560, 572, 585, 597, 609
Basket-plants for conservatories.....558
 for window culture.....572
Bassett, Wm. F., articles by.....21, 82, 188, 235
Bauhinia Galpini.....40
Baxter, Sylvester, articles by.....62, 134, 158, 374, 386, 411
Bay-tree.....238
Beach, Prof. S. A., articles by.....153, 513, 514
Beal, Prof. W. J., article by.....434
Bean, Japanese Soy.....60
Beans, bacterial diseases of.....620*
 experiments in crossing.....33
Bear Meadows, Pennsylvania.....314*
Beaufortia sparsa.....180
Beaumontia grandiflora.....275
Beauty in home surroundings.....529
 the utility of.....181
Bedding arrangements, offensive.....445
Beeches, Purple.....528
Bell, John, paper by.....201
Beet, Sugar.....144, 192, 204
 disease of.....204
Beets, planting.....128
Begonia Baumannii.....76*
 bicolor.....513
 Bismarckii.....152, 585
 Polivivensis, Madelaine.....452
 decora.....501
 diversifolia.....513
 fulgens.....44, 76, 416
 glaucophylla.....100
 scandens.....152
 Gloire de Lorraine.....244*
 gracilis.....513
 grandiflora.....513
 Haageana.....304
 Martiana pulcherrima.....514
 metallica.....596
 nitida.....596
 pictavensis.....452
 racemiflora.....514
 Rex.....596
 rubra.....596
 Scharfiana.....452
 sempervirens.....585
 Triomphe de Lemoine.....189
Begonia sempervirens robusta gigantea rosea.....152
 Vernon.....249, 452
 Verschaffeltiana.....153
Begonias, bedding.....402
 fertilizer for.....552
 in England.....449, 456
 new.....44
 tuberous, as bedding-plants.....476
 cultivation of.....44, 475
 fragraut.....372
 varieties of.....474
Benthamia Japonica.....468
Berberis Thunbergii.....57, 571
 trifoliolata.....580, 611
Berries in Alaska.....384
Bertonia mutabilis.....345
Bertolonias in England.....102
Bidens chrysanthemoides.....567
Bignonia venusta.....104, 162, 587
Binney, Chas. C., articles by.....107, 598
Birds, preference of, for certain trees.....299
 winter feeding of.....264
Blackberries, cultivation of.....260
 disease of.....491, 601
Blackberry, a white.....408
 root-borer.....426
Black Haw.....251
 Knot.....621
Blacknall, O. W., articles by.....68, 186, 340, 459, 537, 568, 570
Bocconia cordata.....332
Boltonia asteroides.....500
 glastifolia.....500
 latisquama.....268*
*Bomarea*s, cultivation of.....78
Bordeaux mixture, effect on grapes.....216, 619
 effect on soil.....12
 experiments with.....71, 102
 for Potato disease.....150, 486
 for Strawberry blight.....432
Borers, Blackberry root.....426
 tree.....426, 557*
Boronia megastigma.....165
Boston, board of survey.....14
 metropolitan park movement.....62, 421
 park commissioners.....300
 public garden.....226
Botanic garden, Berlin.....64
 Brussels.....194
 Dublin.....422
 Munich.....38
 Münden.....182
 Missouri, report of.....311
 Harvard, notes from.....31, 236, 284, 507, 609
Botany in the agricultural colleges.....493
 the study of.....239, 408, 623
Bougainvillea glabra.....428, 587
Bouvardias, propagation of.....43
Boykinia aconitifolia.....424
Brainea insignis.....465
Brandege, T. S., article by.....111
Brasenia peltata.....363
Broad Top, Pennsylvania.....566*, 603
Brewer, Prof. Wm. H., paper by.....210
Brockwell Park, London.....336
Brodiaea peduncularis.....431
 uniflora.....128
Brookline, Massachusetts, gardens in.....165
Broom, Scotch.....267
Brown, Clara S., article by.....515
Brownie Crawfordii.....414
Brugmansia suaveolens.....108
Brussels, botanic garden.....194
Buckhout, Prof. W. A., article by.....314
Buddleia Colvillei.....414
Bulbophyllum densiflorum.....485
Bulbos plants, hardy.....52
 in grass.....265
 in winter.....126
 new.....79
Bulbs, care of.....480
 in the south, cultivation of.....152
Bumelia lycioides.....580
Burial grounds, Quaker.....231
 restful.....301
Burning Bush, the.....555, 572
Butz, Prof. Geo. C., articles by.....139, 414

- C**
- Cabbages, early..... 33
Caecalia coccinea..... 416
Caesalpinia pulcherrima..... 615
Caladium angryrites..... 320
Calanthe Sanderiana..... 414
 vestita Fournieri..... 244
Calathea zebрина..... 596
Calceolarias for commerce..... 112
California flowers in March..... 177
 forests of..... 213, 237, 502, 526, 538
 fruit-growers..... 621
 fruits for England..... 372
 horticultural affairs..... 106
 lemons..... 561
 Lilacs..... 447
 new plants in..... 430
Calla Elliottiana..... 330
 Pentlandii..... 330, 377
Callicarpa purpurea..... 329, 534
Calochortus amoenus..... 431
 macrocarpus..... 430
 nudus..... 430
 Plummerae..... 430
 venustus..... 431
 oculatus..... 178
 cultivation of..... 178
Calopogon pulchellus..... 379
Camassia esculenta..... 284
 Fraseri..... 295
Cameron, R., articles by..... 236, 268, 307, 354, 404, 439
Campanula abietina..... 355
 Gargaria..... 355
 glomerata Daurica..... 308
 speciosa..... 332
 latifolia macrantha..... 332
 Pallasii..... 232
 persicifolia..... 308
 pyramidalis..... 213, 402
 rotundifolia..... 355
 Van Houttei..... 332
Canna Alphonse Bouvier..... 537, 552
 Indica..... 616
 iridiflora..... 616
 J. D. Cabos..... 537
 Madame Crozy..... 478, 537
 Madame J. Sallier..... 616
 Star of '9t..... 462, 478
Canna-seeds, sowing..... 43
Cannas, a history of..... 616
 at Bay Ridge, N. Y..... 478
 Crozy's..... 418, 489
Cape Cod..... 10
 early autumn, near..... 405
 wood roads on..... 574
Capsicum capsicastrum..... 585
Caragana Chamagui..... 232
Card, Fred W., article by..... 562
Cardamine pratensis..... 263
Cardinal-flower..... 408
Carex Fraseri..... 376
Carlina acanthifolia..... 540
Carnation, Ada Byron..... 608
 Anna Webb..... 563, 608
 Buttercup..... 551
 Cyclops..... 393
 Daybreak..... 563, 608
 Dr. Hogg..... 390
 Edna Craig..... 132, 167, 551, 593
 E. G. Hill..... 608
 Ferdinand Mangold..... 608
 Florence..... 608
 Golden Gate..... 166
 Grace Battles..... 12, 132, 166
 Grace Wilder..... 608
 Hector..... 608
 Indiana..... 551
 Lamborn..... 551
 Lizzie McGowan..... 166, 551, 608
 Mary Fisher..... 609
 Mrs. Colflesh..... 166
 Mrs. Fisher..... 608
 Nickolson..... 608
 Paxton..... 609
 Portia..... 608
 Puritan..... 608
 Sentinel..... 166
 Silver Spray..... 608
 Wm. F. Dreer..... 167
 diseases of..... 594
 rust..... 18*
 society, meeting of the New York..... 98
Carnations, best twelve..... 408
 cultivation of..... 112, 320, 608, 612
 garden..... 331
 in England..... 390
 Marguerite..... 150, 488
 new..... 132, 166, 414
 new and old..... 106
Cassandra calyculata..... 220
Cassia corymbosa..... 536
 Marilandica..... 416
 occidentalis..... 580
Castilleja parviflora..... 178
Catasetum Leichtensteini..... 172
Caterpillars, tent, a campaign against..... 601, 604
Cattleya Acklandiae maxima..... 462
 Alexandrae..... 222, 256, 545
 Amesiae..... 329
 Baroness Schröder..... 510
 Burberryana..... 222, 256
 Hardyana Laversinensis..... 48
 labiata..... 166, 545
 Lawrenciana..... 113
 leucoglossa..... 557
Cattleya Lowryana..... 30
 Oweniana..... 462
 Percivaliana..... 102
 Philo..... 256
 princeps..... 329
 Rex..... 6, 396
 Schilleriana Lowiana..... 389
 speciosissima Sanderiana..... 462
 Victoria Regina..... 222, 257, 400
 Warocqueana..... 612
Cattleyas, Mr. Hicks Arnold's..... 129
 cultivation of..... 559
Cauliflowers in Germany..... 132
Caulophyllum thalictroides..... 388
Cayuga country, notes from..... 398, 423, 458, 470
Ceanothus Americanus..... 315, 447
 Andersonii..... 447
 arbores..... 447
 diversifolius..... 447
 foliosus..... 447
 integerrimus..... 447
 megacarpus..... 447
 Parryi..... 447
 prostratus..... 447
 sorediatus..... 447
 spinus..... 447
 thryrsiflorus..... 447
Cedar of Lebanon..... 207, 602*
 the Incense..... 214
 the Red..... 46
Cedrela Sinensis..... 542
Cedronella cordata..... 364
Celastrus articulata..... 540, 572
 scandens..... 568*
Celery-seed, sowing..... 117
Cemeteries, good taste in..... 253
 management of..... 241
 restful..... 231, 301
Cemetery, Walnut Hills..... 290
Centauria Americana..... 416, 579
 suaveolens..... 468, 488
Central Park, aquatic plants in..... 456
 proposed speed-road in..... 109, 145, 181
 surplus trees in..... 350
Centranthus ruber..... 308
Centrosemas as garden plants..... 604
Cercocarpus ledifolius..... 182
 parvifolius..... 184
Cereus giganteus..... 184
Cerinth retorta..... 197
Cestrum aurantiacum..... 32, 525
Chamaecyparis Lawsoniana..... 238
 squarrosa..... 46
Chamaerops humilis..... 516
Chamberlin, John, articles by..... 129, 575
Cherries, a sequence of flowering..... 255
 cultivated native..... 358
 of north-eastern Europe..... 583
Cherry, Emperor Francis..... 414
Cherry-trees, black knot on..... 621
 insects on..... 203
Chestnut grafted on oak..... 326
Children and tree-planting..... 530
 floriculture for..... 407
Chilopsis saligna..... 615
Chimaphila maculata..... 507
China-Asters, cultivation of..... 111, 151
Chinch bug, diseases of..... 492
Chionanthus Virginica..... 287
Chionodoxa Alleni..... 480
 Cretensis..... 488
 Forbesii..... 489
 gigantea..... 489
 grandiflora..... 42, 489
 Luciliae..... 489
 Sardensis..... 489
 Tmolusi..... 489
Chirita depressa..... 49
Chiswick garden..... 473
Christ, H., articles by..... 45, 280
Christmas Roses..... 42
Chrysanthemum, A. G. Ramsey..... 527
 A. T. Ewing..... 503
 Ada Strickland..... 551
 Autumn Queen..... 503
 Avalanche..... 579
 Beauty of Exmouth..... 536, 579
 Black Beauty..... 551
 Brookleigh Gem..... 579
 C. B. Whitnall..... 595
 Carrie Bell..... 559
 Charles Blick..... 579
 Chryssippe..... 612
 cinerariaefolium..... 588
 Clarence..... 559
 Col. Wm. B. Smith..... 557, 562, 569
 Cullingfordi..... 612
 Dorothy Shea..... 579
 Dr. Covert..... 596
 Dr. Sharp..... 612
 Edwin Lonsdale..... 579
 Emily Doone..... 557
 Ethel..... 595
 Exquisite..... 612
 Farview..... 551
 Faust..... 612
 Flora Hill..... 596
 Florence Davis..... 579
 G. W. Childs..... 551, 562, 595
 George W. Childs Drexel..... 551
 Gloriana..... 595
 Gold..... 596
 Gold-finder..... 595
 Golden Ball..... 551, 557
 Golden Empress of India..... 579
 Golden Wedding..... 539, 551, 556*, 563
Chrysanthemum, Gus Harris..... 612
 H. F. Spaulding..... 551
 Harry Balsley..... 562
 Harry May..... 527
 Harry Sunderbruch..... 563
 Hicks Arnold..... 527
 Irma..... 562
 Ivory..... 551
 J. J. Cliffe..... 564, 576
 John Goode..... 551
 John Lane..... 596
 lacustre..... 464
 La Deuil..... 570
 Leila..... 551
 Lewis Childs' Madeira..... 551
 Marguerite Jeffords..... 562
 Mars..... 551
 Marvel..... 595
 Maud Dean..... 563
 Mayme Ryan..... 563
 Mermaid..... 539
 Miss Annie Manda..... 527, 612
 Miss Eva Hoyt..... 596
 Miss V. Tomlin..... 570
 Molly Bawn..... 595
 Mont Blanc..... 596
 Mr. C. Shrimpton..... 570
 Mrs. A. J. Drexel..... 551
 Mrs. Alpheus Hardy..... 527
 Mrs. C. Myers..... 536
 Mrs. C. H. Duhme..... 563
 Mrs. C. I. Thompson..... 551
 Mrs. Charles Dissell..... 596
 Mrs. E. D. Adams..... 527
 Mrs. F. L. Ames..... 550
 Mrs. H. A. Pennock..... 596
 Mrs. Humphreys..... 595
 Mrs. H. J. Jones..... 595
 Mrs. Isaac Price..... 595
 Mrs. J. Evermann..... 551
 Mrs. J. W. Crouch..... 563
 Mrs. James W. Paul..... 551
 Mrs. Jerome Jones..... 550
 Mrs. John Westcott..... 596
 Mrs. M. J. Thomas..... 551
 Mrs. Langtry..... 612
 Mrs. Lewis..... 527
 Mrs. R. Elliott..... 596
 Mrs. Robert Craig..... 551
 Mrs. S. Coleman..... 570
 Nemasket..... 550
 Niveus..... 562
 Nymphaea..... 612
 O. P. Bassett..... 595
 Ox-blood..... 550
 Pelican..... 596
 Pink Pearl..... 551
 Potter Palmer..... 596
 Progne..... 612
 Robert McInnes..... 593
 Robert P. Field..... 579
 Rosstrevor..... 551
 Rosa Morn..... 570
 rotundifolium..... 184
 Sarah Hill..... 563
 Snowflake..... 550
 Standstead white..... 570
 Sunflower..... 570
 Syringa..... 595
 The Queen..... 563
 Theodore Bock..... 563
 Thrumpton..... 570
 Vivian Morel..... 557, 570
 W. H. Atkinson..... 557
 W. H. Lincoln..... 551
 Walter Hunnewell..... 16*
 White Cap..... 595
 William Seward..... 536
 Yellow Ball..... 550
 Blight..... 553, 168
 color, varieties of..... 60
 exhibition, Boston..... 550
 Cincinnati..... 562
 London..... 568
 Los Angeles..... 515
 New York..... 539
 Philadelphia..... 551
 Short Hills..... 566
 flowers at exhibitions..... 549
Chrysanthemums, crown-bud of..... 513
 cultivation of..... 381, 480
 fragrant..... 612
 frozen, at the Royal Aquarium..... 478
 late..... 595, 596
 naturally grown..... 573
 new..... 67
 pedigree seedling..... 561
Cimicifuga racemosa..... 332
Cineraria, Snowflake Improved..... 209
Cinerarias, cultivation of..... 166
Cirrhopetalum Amesianum..... 268
 Colletti..... 30
 ornatissimum..... 220
 Thourasii..... 40
 Wendlandianum..... 30
Cissus discolor..... 564
Citrus trifoliata as a hedge-plant..... 44, 81, 600
Citradrastis lutea..... 267, 516
Clematis aromatica..... 301
 brevicaudata..... 138*
 Chandleri..... 391
 coccinea..... 292, 391
 crispa..... 391
 Davidiana..... 453
 Eriostemon..... 391
 Spachiana..... 391
 Hendersoni..... 391
 Jackmanni, late flowering of..... 538
Clematis ochroleuca..... 295
 paniculata..... 90*, 441
 grafting of..... 620
 Pitchei..... 391
 Sargentii..... 391
 Viorna..... 364, 391
 Virginiana..... 615
 Viticella..... 390
Clerodendron Balfourii..... 428
 fallax..... 560
Clethra tomentosa..... 182
Cleveland, H. W. S., article by..... 131
Clifton, N. J., water-garden at..... 310, 494*
Climbing plants in the Pines..... 400
 summer greenhouse..... 428
 winter..... 162
Clivea miniata..... 596
Cliveucharis pulchra..... 42
Clover and chemicals..... 143
Coblentz, river garden at..... 554, 598
Cochlioda Neesiana..... 530
Cocoa-fibre, uses of..... 43
Cocos insignis..... 174
 Pynartii..... 41
 Weddelliana..... 174
Coccolyne cuprea..... 413
 Dayana..... 293
 fimbriata..... 572
 Micholitziana..... 30
 Sanderiana..... 378
Colchicum autumnale..... 523
 Byzantinum..... 524
 speciosum..... 524
 variegatum..... 524
Colchicums, cultivation of..... 523
Collins, J. F., article by..... 299
Columbian fair, New Jersey building at..... 362*
 grounds, design of..... 278, 289*
 the future of..... 501
Combretum purpureum..... 586
Concord, Mass..... 623
Conifers, American, in Scandinavia..... 230
 at Wlesley..... 385
 hardy, at Kew..... 603
 in England..... 556
 manual of..... 554
 of north-west America..... 64
 of Western America..... 227
 pruning..... 485
 raising from seed..... 274
 winter killing of..... 215, 250, 272
Conservatory, flowers for..... 129, 558, 585
Convallaria majalis..... 376
Cook, Vincent, articles by..... 19, 269, 331, 333, 366, 473
Coontie and Conte..... 208
Copenhagen, plants at..... 135
Copper compounds, adulteration of..... 90
 effects on soil..... 12, 72
 for grapes..... 71, 216, 619
 for potatoes..... 486
 for strawberries..... 432
Cordyline australis, new varieties of..... 535
 indivisa..... 535
Corema Conradii..... 484
Coreopsis Drummondii..... 488
Coreopsis grandiflora..... 416
 laeocaulata..... 416
 monstrosa..... 393
 tinctoria..... 416
Cornus alternifolia..... 75
 Baileyi..... 75
 Nuttallii..... 436
 sericea..... 75
 stolonifera..... 75
Coronilla varia..... 159
Coryanalis leucocorys..... 4
Corydalis bulbosa..... 189
 nobilis..... 260
Corylopsis pauciflora..... 204, 225, 341*
Corypha australis in California..... 514
Cosmos hybridus..... 488
Costus igneus..... 494
Cotinus Americanus..... 83
Cotoneaster acuminata..... 572
 Simoni..... 572
 vulgaris..... 572
Cottonwood trees..... 277
Country houses, New England..... 321
 seat, southern, the old..... 459
Crab-apple, double-flowered American..... 252
Crataegus aestivalis..... 218
 brachyacantha..... 218
 coccinea..... 424
 cordata..... 218
 Crus-galli..... 217
 Douglasii..... 218
 flava..... 218
 mollis..... 218*
 oxyacantha..... 254
 parvifolia..... 437
 punctata..... 424
 American species..... 218
Crinum Rozenianum..... 41
 Sanderianum..... 390
Crococoma aurea..... 582
Crocus, species of..... 582
Crotons, cultivation of..... 489
Crozier, A. A., paper by..... 315
Cucumis anguria..... 580
Cultural directions, the use of..... 577
Cuphea lanceolata..... 416
 silenoides..... 416
Curcuma Roscoeana..... 597
Curran, Crandall's..... 128
Cuttings, fungous diseases of..... 91
Cycads at Kew..... 497

Cycads, botanical history of..... 534
 Cyclamen, a double-flowered..... 234*
 European..... 282, 465
 Ibericum..... 465
 macropum..... 465
 Persicum..... 107, 155, 234*, 343
 proliferous flower of..... 234*
 Cyclamens, cultivation of..... 343, 594
 dwarf..... 495
 hardy..... 495
 Cycnoches, fertilization of..... 156
 glanduliferum..... 172
 Peruvianum..... 4
 varieties of..... 88
 Cydonia simplex alba..... 232
 Cymbidium cyperifolium..... 6
 Hookerianum..... 102
 Humboldtii..... 497
 pulcherrimum..... 30
 Winnianum..... 556
 Cyperorchis Mastersii..... 6
 Cyperus alternifolius..... 597
 Cypress, Bald, knees of..... 232
 lumber, artificial drying of..... 492
 Cypripedium Baconis..... 172
 Bartefii angustum..... 622
 Bosscherianum..... 148
 Bryanii..... 389, 497
 Brysa..... 244
 Calceolus macranthos..... 244
 caudatum..... 414
 Chamberlainianum..... 113, 172, 412*
 chrysocomes..... 413
 Cleopatra..... 244
 Cowlayanum..... 148
 Cybele..... 562
 Daisyæ..... 460*
 decorum..... 148
 Edwardii..... 454
 Ensign..... 148
 Ephialtes..... 562
 eurlochus..... 413
 Evenor..... 413
 Exul..... 222, 256
 Iischootianum..... 304
 Gigas..... 148
 H. Ballantine..... 461
 Harrisianum..... 612
 Huybrechtsianum..... 256
 lanthe..... 244
 lawrellum..... 209, 244
 Leda..... 172
 Leeanum and varieties..... 116
 lutescens..... 598
 pulchellum..... 598
 Lindleyanum..... 102
 Lucie..... 173
 luridum grandiflorum..... 562
 lutescens..... 598
 Monieur Finet..... 148
 Niobe magnificum..... 622
 Shorthillense..... 622
 pariflorum..... 286
 pubescens..... 286
 Rothschildianum..... 252
 Swinburnei..... 148
 Tautzianum..... 389
 Warnero-superbiens..... 510*
 Youngianum superbum..... 389
 Cypripedium, American, in Eng-
 land..... 257
 new..... 30
 in Mr. Hicks Arnold's Col-
 lection..... 139
 Cyrtodiera Chontalensis..... 558
 Cyrtidium chryotidum..... 495
 falcatum..... 495
 Cytisus capitatus..... 315
 hirsutus..... 280
 nigricans..... 295, 300
 purpureus..... 254, 295
 Scoparius..... 15, 226
 Andreanus..... 185

D

Daffodil, King Umberto..... 270
 Saragossa..... 270
 Daffodil-larm, an English..... 198
 Daffodils, new..... 240
 Dahlias, Cactus, good varieties of..... 462
 Tom Thumb..... 430
 Daisies, Michaelmas..... 521
 Dalea spinosa..... 83
 Dandelion as a garden-plant..... 258
 Dandridge, Mrs. Danske, articles by..... 15,
 100, 186, 232, 254, 267, 279, 292, 315,
 328, 340, 352, 520, 532, 544, 621.
 Daniels, George F., paper by..... 111
 Daphne Genkwa..... 100
 Mezereum..... 225
 Darbeyia umbellulata..... 508
 Dartmouth, Mass..... 69
 Datura arborecens..... 252
 Davis, L. D., article by..... 443
 Dawson, Jackson, article by..... 273
 Delphinium Cashmirianum..... 344
 consolidum..... 416
 udicaule..... 332
 Przewalskianum..... 332, 344
 Sinense..... 464
 Zalil..... 332, 344
 Dendrobium, Adrasta..... 209, 244
 barbatulo-chlorops..... 243
 chrysanthum..... 572
 chrysocephalum..... 497
 chrysoxotum..... 534*
 crassinode..... 129

Dendrobium, Cybele..... 128
 densiflorum clavatum..... 244
 formosum..... 572
 giganteum..... 544
 Leeanum..... 4, 39, 390
 Nestor..... 413
 nobile..... 180
 O'Brienianum..... 173
 Phalænopsis..... 408, 439*, 472
 Schroëderianum..... 129, 174,
 208
 platycaulon..... 485
 Rolfæ..... 256
 Schneiderianum..... 129
 striatum..... 557
 Dendrological society in Germany..... 612
 Dentaria diphylla..... 60
 Desmanthus leptolobus..... 579
 Desmodium Canadense..... 416
 Deutzia candidissima flore-pleno..... 331
 parviflora..... 263
 scabra..... 330
 Watsoni..... 331
 Dewar, D., article by..... 42
 Dewberries, cultivation of..... 23
 De Wolf, John, article by..... 63
 Dimmock, A., articles by..... 128, 534
 Dianthus armulatus..... 332
 calizonus..... 184
 Carthusianorum..... 159
 sylvestris..... 159
 Dicentra spectabilis..... 260
 Dichondra repens..... 532, 579
 Dictionary of botanical terms..... 491
 Didiscus cœruleus..... 416
 Didymocarpus lacunosa..... 257
 Digitalis ciliata..... 588
 Dion edule..... 497
 pectinatum..... 497
 Dioscorea illustrata..... 428
 Diospyros Texana..... 580
 Diphyllia cymosa..... 388
 Dipladenia illustris glabra..... 42
 Dirca palustris..... 343
 Disa Cooperi..... 102
 incarnata..... 257, 341, 412
 Veitchii..... 376
 Disporum lanuginosum..... 39
 Dock, Miss Mira Lloyd, articles by..... 566,
 603
 Dodge, Miss Louise, articles by..... 351,
 376, 478, 484
 Dolichos Japonicus..... 574
 Lablab..... 488
 Dongan Hills, plants at..... 418
 Douglas, Thomas H., article by..... 591
 Dracæna indivisa Veitchi variegata..... 450
 Dracænas, cultivation of..... 383
 Drosera filiformis..... 363
 longifolia..... 363
 Dyeing flowers..... 150

E

Eastham, Mass..... 10
 Eaton, H. A., article by..... 622
 Echinacea purpurea..... 415
 Egg-plant seedlings, fungous dis-
 ease of..... 164*
 Eisen, Gustav, papers by..... 322, 334
 Elæagnus crispata..... 586
 edulis..... 586
 longipes..... 255
 a spurious..... 586
 parvifolia..... 586
 rotundifolia..... 586
 umbellata..... 540, 586
 Elbow-room in green-house plants..... 445
 Electric light on green-house plants..... 479
 Electricity in agriculture..... 47
 Eleutherococcus senticosus..... 183
 Elm at Derby Line, Vt..... 303*
 Penn treaty, offshoot of..... 312
 Elms of the St. Lawrence Valley..... 86
 Elymus glaucus..... 394
 Emilia sagittata..... 416
 Encephalartos Altenstini..... 497
 villostus..... 497
 Endicott, W. E., articles by..... 79,
 283, 392, 452, 524
 Engleheart, Rev. G. H., paper by..... 308
 Epidendrum cochleatum..... 585
 Dellense..... 31
 Godseffianum..... 148
 nocturnum..... 585
 pusillum..... 76
 Watsonianum..... 102
 Epigæa repens..... 202
 Epiphyllum Gaertneri..... 42
 truncatum..... 32, 587
 Episcia Chontalensis..... 553
 Eria marginata..... 303
 Erica carnea..... 520
 cristata..... 485
 hymenalis..... 136*, 257
 Ericas, cultivation of..... 55
 Erigeron bellidifolius..... 296
 Eriocalon in N. J..... 363
 Erodium macradenum..... 332
 Manescavi..... 332
 Eryngium amethystinum..... 394
 Leavenworthii..... 580
 Erythra armata in California..... 514
 edulis in California..... 514
 Erythrina Crista-galli..... 328
 Hendersoni..... 536
 Erythronium giganteum..... 436
 grandiflorum..... 178

Erythronium Hartwegii..... 178
 Eschscholzia Californica..... 453
 Eucalyptus alpina..... 516
 amygdalina..... 262
 globulus..... 262
 corynocalyx..... 262
 Nestor..... 263, 536
 marginata..... 262
 polyantha..... 262
 rostrata..... 262
 viminalis..... 262
 extract from..... 564
 Eucharis Amazonica..... 596
 grandiflora..... 512, 597
 Stevensii..... 512
 Eucryphia pinnatifolia..... 555
 Eulalia gracillima univittata..... 418, 600
 Eulophiella Elisabethæ..... 304, 510
 Eupatorium perfoliatum..... 416
 Euphorbia pulcherrima..... 392, 587
 Europe, notes of a summer journey
 in, 14, 38, 63, 75, 87, 123, 135, 171, 182,
 194, 206, 231, 506, 543, 554, 578, 602.
 Evergreen shrubbery..... 15
 Evergreens, hardy..... 57
 hardy broad-leaved..... 82
 in snow..... 37*
 Evonymus atropurpurea..... 555, 572
 Sieboldii..... 15
 Exhibit, Boston..... 155, 491, 550
 Cincinnati..... 562
 Eden Muscæ..... 119
 London..... 293, 568
 Los Ang-les..... 515
 New York..... 539, 549
 Philadelphia..... 166, 551
 Shard Hills..... 119, 526
 wild flowers at Edinburgh..... 382
 Exochorda grandiflora..... 282
 Exotic plants in European gardens,
 introduction of..... 54
 Eysenhardtia amorphoides..... 532

F

Fairchild, Prof. D. G., paper by..... 71
 Fairhaven, Mass..... 69
 Fairmount Park, Philadelphia..... 326
 Fall River, Mass..... 69
 Falmouth, Mass..... 69
 Farley, Caroline A., article by..... 226
 Farm, a modern, Massachusetts..... 145*
 Farms, abandoned, in Massachu-
 setts..... 600
 Farquhar, Robert, paper by..... 407
 Fatsia horrida..... 172
 Japonica..... 596
 Fayetteville, N. C., notes from..... 592
 Fernow, B. E., article by..... 609
 papers by..... 20, 190, 250
 Ferns, cultivation of..... 308, 464, 524
 for sunless windows..... 597
 hardy..... 200
 in England..... 449
 nematodes on..... 156
 potting..... 67
 Fertilizer, nitrogenous..... 180
 Ficus Carica..... 489
 elastica..... 536
 bushy habit of..... 203
 Finlayson, Kenneth, paper by..... 594
 Fir, Silver..... 171
 White Silver..... 214
 Firs on the Maine Coast..... 97*
 Flax, cultivation of, in Washington..... 66
 Flax, W. H., death of..... 408
 Flora, mountain, of Alabama..... 507
 of Nebraska..... 264
 of Michigan..... 396
 of Smyth County, Virginia..... 364,
 375, 388, 424, 437
 Floriculture, civilizing power of..... 410
 for children..... 407
 Florida, winter vegetation of..... 52
 Pines in..... 73*
 sand dunes, winter vegetation..... 21
 Florists, American, convention of,
 406, 576
 Flower and fruit mission..... 372
 partly, a Japanese..... 105
 Flowers, early spring..... 157, 177,
 Easter, in Philadelphia..... 203
 free distribution to children..... 276
 in town..... 195
 perforation of, by insects..... 206*
 picturesque names for..... 614
 sale of, in Boston streets..... 239
 some uses of..... 133
 wayside..... 419
 wild, in cultivation..... 166
 preservation in Illinois..... 288
 Foliage-plants..... 537
 Folk-lore, American..... 575
 Forest, a pine, in Lower California..... 183*
 destruction in Russia..... 417
 Epping..... 542
 experiment station at Santa
 Monica..... 262
 fires, danger of..... 170
 Hill Nurseries, England..... 246
 planting..... 274
 profit in..... 250
 policy, a national..... 397
 history of..... 144
 reservation, proposed, in Al-
 leghany Mountains..... 325
 in Colorado..... 108
 in northern Min-
 nesota..... 50

Forest reservations, national..... 20, 25, 589,
 613
 trees, internal decay of..... 207
 Forestry Association, American..... 11
 at West Point..... 86
 for the farmer..... 104
 in Pennsylvania..... 612
 in Prussia..... 393
 in the United States..... 34
 legislation, proposed..... 11
 practical..... 265
 school of..... 485
 Forests and forest-flowers, southern
 and the flow of streams..... 70
 as modified by human
 agency..... 356, 369
 of California..... 213, 237, 502, 526, 538
 of Germany..... 214, 576
 of India..... 219
 of Lower California..... 183*
 of Minnesota..... 297
 of Roan Mountain, N. C..... 334
 of southern Alleghany Moun-
 tains..... 155
 of Washington..... 57
 Pine, waste from..... 482
 public..... 542
 indifference to..... 157
 White Mountain, movement
 to preserve..... 517, 565
 Forsythia suspensa..... 249
 viridissima..... 249
 Forsythias, notes on..... 249
 Foster, Prof. M., paper by..... 258, 429
 Foxgloves, use of..... 312
 Fragaria Virginiana..... 435
 Franceschi, Dr. E. F., article by..... 514
 Francoa ramosa..... 464
 Fraxinus Americana microcarpa..... 508
 Freesia odorata lilacina..... 79
 refracta alba..... 585
 purpurescens..... 79
 French, J. D. W., paper by..... 34
 Fritillaria biflora..... 178
 Dalmatica..... 212
 lanceolata gracilis..... 178
 recurva..... 178
 Fruit and flower mission..... 372
 culture..... 491
 for cold climates..... 261, 306
 growers, California..... 621
 high grade, how to obtain..... 7
 market in England..... 4
 ornamental, on autumn plants..... 504
 ripening, chemical changes in
 trees, artificial training of..... 507, 543
 in flower..... 316
 spraying of..... 588
 Fruits, American, for America..... 518
 and vegetables at Boston..... 491
 correlations of quality in..... 495
 edible, in the Pines..... 435
 foreign, for England..... 324
 nutritive, value of..... 312
 of eastern Asia..... 469
 premature dropping of..... 514
 Russian..... 453
 Small..... 342
 Fuchsia Dunrobin Bedder..... 19, 474
 Fuchsias for bedding..... 572
 in England..... 366
 in England..... 474
 Fungi, economic..... 455
 on variegated plants..... 142
 Fungicides in the orchard..... 261
 Fungous diseases in cutting beds..... 91
 in the forest..... 37
 in the orchard..... 526
 Fungus, the graft-box..... 306
 Funkia subcordata grandiflora..... 441

G

Galactia heterophylla..... 532
 Galanthus Alleni..... 42
 nivalis..... 42
 Octobrensis..... 19
 Racheliæ..... 42
 Galax aphylla..... 110, 604*
 Galium aristatum..... 356
 Mollugo..... 292
 Gallaher, Frank M., article by..... 262
 Garden-art..... 407
 experiment, at Wisley, Eng-
 land..... 269
 experiments..... 33
 June..... 315, 320
 plants, new..... 30
 the flower, in England..... 141
 the formal, in England..... 142
 the vegetable..... 92, 261, 366, 512
 Gardening a human bond..... 431
 beside a hot spring..... 611
 Gardens and greenhouses, architec-
 ture of..... 612
 Gardens, architects..... 467
 formal..... 205
 herbaceous..... 500
 housetop..... 125
 in northern Germany..... 358
 Japanese..... 170*, 360, 384
 old-time southern..... 349, 368
 public, in London..... 616
 spring..... 176
 water..... 177, 283, 310, 332, 354,
 404, 494*
 wild..... 237, 295, 310, 494*

- Gardens, winter..... 116
 Gardenia florida..... 592
 Genista tinctoria..... 331
 Gentiana acaulis..... 270
 — Andrewsii..... 165
 — crinita..... 164
 — cristata..... 165
 — puberula..... 165
 — quinqueflora..... 165
 — serrata..... 165
 Geranium, Henry Cox..... 344
 — sanguineum..... 332
 Gerard, J. N., articles by..... 6, 19, 33, 44, 67, 76, 82, 104, 116, 126, 149, 152, 176, 184, 200, 209, 212, 235, 249, 273, 283, 296, 297, 310, 318, 332, 344, 346, 368, 369, 393, 394, 418, 430, 439, 453, 464, 477, 478, 488, 513, 549, 573, 587, 606, 619.
 Gerbera Jamesoni..... 511
 Germany, forestry in..... 214, 393, 576
 — northern, gardens in..... 165
 Gingko, the..... 603
 Ginseng, cultivation of..... 223
 — in North Carolina..... 164
 Gipsy moth, insect lime for..... 528
 Gladioli, garden, origin of..... 300
 — winter care of..... 15
 Gladiolus Armeniacus..... 318
 — Gandavensis..... 545
 — Numa..... 462
 — oppositiflorus..... 545
 — Poetes..... 462
 — species of..... 582
 Gleichenia dicarpa longipinnata..... 308
 — rupestris glaucescens..... 308
 Gloxinia, Duke of York..... 390
 — Her Majesty..... 390
 Glycine hispida..... 60
 Goff, Prof. E. S., articles by..... 246, 467
 Goldring, W., articles by..... 449, 461
 Gongora gratulabunda..... 184
 Gonolobus hirsutus..... 328
 Goodman, T., paper by..... 268
 Goodrich, Miss S. F., article by..... 200
 Graft and stock, mutual influence of
 Grafting Chestnut on Quercus Mu-
 beckii..... 326
 — notes on..... 39, 59, 54, 165, 178
 Grape, fructification of the..... 597
 — Prigère de Varna..... 244
 — season of 1892..... 548
 — self-pollination of..... 451*
 — vines, diseases of..... 618
 — pruning..... 612
 Grapes, a few neglected..... 512
 — effect of spraying..... 216
 — grafting..... 498
 — outdoor cultivation of Euro-
 pean..... 618
 — varieties of..... 547
 Grass, Rhode Island Bent..... 618
 — Uva..... 196
 Grasses, promising..... 434
 Greene, Prof. E. L., articles by..... 436, 447
 Greenhouse and stove plants..... 40
 — climbers, summer..... 428
 — for amateurs..... 66, 140, 233
 — heating..... 420
 — walls, plants for covering..... 104
 — work in January..... 31, 43
 — work in July..... 319
 Greenhouses, glass bricks for..... 552
 — insects in soil of..... 117
 — shading..... 200
 — sub-irrigation in..... 504
 Greenlee, L., articles by..... 110, 164
 Grevillea robusta..... 537
 Grey, Robert M., articles by..... 454, 502
 Greyia Sutherlandii..... 102
 Grottoes, garden, in France..... 518
 Guillemia speciosa..... 204
 Gynura sarmatensis..... 341
 Gypsy Moth, extermination of..... 81, 119
 — in Europe..... 75
- II**
- Habenaria carnea..... 31, 77
 — fimbriata..... 395, 454
 — longicalcarata..... 220
 — militaris..... 462
 — orbiculata..... 424
 — psychodes..... 424
 Hamanthus Katherinæ..... 390
 Haddon Hall, terrace at..... 326*
 Halesia diperta..... 611
 — tetraptera..... 318
 — Meehan..... 534*, 611
 Half-hardy plants, wintering..... 358
 Halsted, Prof. Byron D., articles by..... 18, 56, 91, 141, 164, 224, 248, 353, 379, 406, 495, 477, 501, 595, 620.
 Hamamelis Virginiana..... 555
 Hansen, Dr. C. E., article by..... 230
 Hardy, Auguste, death of..... 24
 Harebells at Wellesley..... 353
 Harman, Mary F., article by..... 251
 Harris, W. K., article by..... 596
 Harrison, J. B., articles by..... 9, 69, 93
 Harshberger, J. W., articles by..... 45, 395
 Harvard botanic garden, notes from..... 216, 284, 507, 609.
 Hatfield, T. D., articles by..... 116, 57, 63, 92, 106, 152, 153, 176, 187, 213, 237, 332, 355, 381, 383, 441, 513, 561, 585, 595, 608
 Hawthorns, the American..... 217
 Health of plants, constitutional..... 118, 130
 Heather, cultivation of..... 120, 403
 Helenium autumnale striatum..... 492
 Helianthemum vulgare..... 332
 Helianthus multiflorus..... 474
 — plenus..... 500
 — Soliel d'Or..... 500
 — orgyalis as a wall plant..... 26*
 Helioopsis, collection of..... 394
 — laevis..... 403
 Hellebores, cultivation of..... 8, 42
 — spring flowering..... 188
 — varieties of..... 42
 Helleborus niger..... 280
 Helonias bullata..... 220
 Helwingia rusciflora..... 182
 Hemlocks in winter..... 37*
 Herbarium of William M. Canby..... 540
 — the oldest..... 408
 Herniaria glabra..... 252
 Hersey, Edmund, article by..... 609
 Heuchera micrantha..... 431
 — sanguinea..... 308
 Hibiscus Moscheutos..... 46, 412
 Hicoria Pecan..... 531
 Hickories, disease of..... 480
 Hieracium aurantiacum..... 615
 — venosum..... 567
 Highways, improvement of..... 515
 Hill, E. J., articles by..... 16, 74, 110, 201, 208, 412, 448
 Hippeastrum reticulatum..... 420
 Hippeastrums at Chelsea, Eng..... 184
 — cultivation of..... 585
 Hollows, low temperature of..... 346
 Holm, Theo. M., article by..... 234
 Honeysuckle, Japanese..... 292
 Honeysuckles, bush..... 345
 Hornbeam, the..... 215, 602
 Horsford, F. H., article by..... 615
 Horticultural education..... 54, 116, 252, 553, 587
 — Society of Western New
 York, meeting of..... 58, 79
 Horticulture in California..... 106
 — in Kansas..... 622
 — in New York..... 58, 79
 — in North America..... 454
 — specialized..... 585
 — school at Versailles..... 506
 Hoskins, T. H., M.D., articles by..... 16, 86, 125, 207, 261, 303, 306, 370, 410, 489, 558, 583.
 House-decoration, plants for..... 148
 House-plants, for shady windows..... 596
 — frosted..... 612
 — walls, covering, 26*, 90*, 43*, 500*
 Houses, color of..... 146, 189, 285
 Hovenia dulcis..... 14
 Hudsonia tomentosa..... 111, 220
 Hunn, C. E., article by..... 379
 Hunnewell, H. H., article by..... 250
 Hunt, T. Sterry, article by..... 176
 Hutchins, W. T., article by..... 34
 Hyacinths, propagation in England..... 222
 Hybridizing..... 2
 Hyde, Sidney, article by..... 105
 Hydrophyllum Forbesii..... 100
 Hydrangea hortensis..... 225
 — Oak-leaved..... 336
 — paniculata..... 336
 — grandiflora..... 402
 — scandens..... 183
 Hydrastis Canadensis..... 437
 Hypericum Mosserianum..... 450
 — opacum..... 304*
 — patulum..... 328
 Hypolepis distans..... 404
- I**
- Iberis sempervirens..... 166, 272
 Icones Plantarum, Hooker's..... 155
 Ilex levigata..... 572
 — opaca..... 437
 — Sieboldii..... 225
 — verticillata..... 572
 — vomitoria..... 592
 Imantophyllum miniatum..... 544, 621
 Impatiens mirabilis..... 42
 Incarvillea Delavayi..... 288
 Indian Ridge, Mass..... 434
 Insecticides and spraying machines..... 203
 — in the orchard..... 203, 204, 261, 310.
 — in the vineyard..... 619
 Insects in greenhouse soil..... 117
 — injurious legislation against..... 457, 490, 601
 — on Cherry-trees, remedy for..... 203
 Ipomoea Bronsonii..... 345
 — purpurea, a double..... 480, 592*
 Iridaceæ, a handbook of..... 581
 Iris, alata..... 259
 — Anglica..... 297
 — Bakeriana..... 143, 152, 180, 619
 — Caucasica..... 259
 — Chamæiris..... 236
 — cristata..... 249, 364
 — cuprea..... 297
 — Danfordiæ..... 152, 619
 — Fosteriana..... 40, 42
 — German..... 287
 — Germanica..... 608
 — gigantea..... 297
 — histrioides..... 143, 152
 — Kämpferi..... 269, 452, 618
 — Kolpakowskyana..... 259
 — levigata..... 618
 — Lorteti..... 429
 Iris lutescens..... 236
 — Missouriensis..... 236
 — Olbiensis..... 236
 — ochroleuca..... 297
 — oxypetala..... 236
 — Persica..... 259
 — pumila..... 236
 — reticulata..... 152, 258, 619
 — Krelagei..... 258
 — Robinsoniana..... 40
 — Rosenbachiana..... 259
 — Sibirica..... 236
 — scorpioides..... 259
 — Sisyrinchium..... 258
 — Susiana..... 429
 — tripetala..... 369
 — Troyana..... 297
 — xiphoides..... 259, 619
 — Xiphium..... 619
 — species of..... 582
 Irises, bulbous..... 258, 619
 — cultivation of..... 272, 565, 573, 606, 619
 — early..... 152
 Irrigation in France..... 144
 — in Kansas..... 623
 Islay, the..... 469*
 Italy, garden tools in..... 376
 — wild flowers in..... 351
 Itea Virginica..... 292
 Ivy, the German..... 573
 Ixias, species of..... 582
- J**
- Jack, J. G., articles by..... 14, 29, 38, 63, 75, 87, 112, 123, 135, 171, 182, 194, 206, 225, 231, 249, 255, 262, 294, 318, 330, 343, 353, 367, 399, 402, 426, 506, 543, 554, 571, 578, 580, 602.
 Jacobinia aurantiaca..... 318
 — coccinea..... 318
 — magnifica..... 317*
 Japanese flower arrangement..... 22, 35
 — flower party..... 105
 — garden..... 170*, 36
 Jardin des Plantes, Paris..... 204
 Jasminum nudiflorum..... 100
 Jatropa podagrica..... 344
 Jeffersonia diphylla..... 364
 Jericho Roses..... 506
 Jonesia Asoka..... 384
 Juncus compressus..... 528
 — Cooperi..... 528
 — ciliatus spiralis..... 369
 Juniperus Virginiana..... 46
- K**
- Kalmia glauca..... 182
 Kansas Horticultural Society..... 622
 Kellogg, George J., articles by..... 131, 514
 Kelloggias, new..... 276
 Kelsey, Fred. W., article by..... 273
 Kennedy rubicunda..... 162
 Kerr, Mark B., article by..... 526
 Kerria Japonica..... 282
 Keyes, H. P., article by..... 550
 Kew, arboretum, the..... 602
 — gardens..... 26, 579
 — new herbaceous border at..... 402
 — Rock-garden at..... 426*
 — temperate house at..... 398*
 Kidder, Nathaniel T., article by..... 251
 Kinney, Abbott, article by..... 215
 Knapp Hill Nursery..... 304
 Kniphofia corallina..... 464
 — modesta..... 511
 — Northiæ..... 377
- L**
- Labels, plant..... 312, 405, 598
 Laburnum Adami..... 295
 — alpinum..... 295
 — vulgare..... 294
 Lachenalia Aureliana..... 102
 — Comesii..... 79
 — pendula..... 79
 — Regaliana..... 79
 Lachenalias, cultivation of..... 585
 Lælia anceps Schröderæ..... 128
 — Arnoldiana..... 31, 324
 — cinnabarina..... 129
 — flammea..... 128
 — grandis tenebrosa..... 329
 — Gravesiæ..... 450
 — Latona..... 258, 400
 — monophylla..... 402
 — Oweniana..... 414, 510
 Lælio-Catleya Hippolyta..... 128
 — Ingramii..... 474, 510
 — Marriottiana..... 244
 — Phœbe..... 258, 400
 — Proserpine..... 461
 La Mance, Lora S., articles by..... 166, 418, 431, 525
 Lamborn, Dr. Robert H., article by..... 483
 Land office, the U. S..... 345
 Landscape-art as a profession..... 541
 — for women..... 482
 — simplicity in..... 313
 — in the Columbian fair
 grounds..... 278, 785
 — pretenders in..... 302
 — beauty, value of..... 529
 Landscape-gardening on Mount
 Desert..... 530
 Lapageria rosea..... 428
 — alba..... 428
 Larch, the European..... 87
 Larkspurs, perennial..... 344
 — the scarlet..... 178
 Lathyrus tuberosus..... 297, 320
 Laurel, the California..... 238, 349*
 Lawn, color for, in November..... 555
 Lawn-making, Olcott's system..... 453
 Lawns, formation and care of..... 618
 Lazenby, Prof. Wm. R., article
 by..... 382
 Learned, J. E., article by..... 141
 Leaves, bright winter..... 110
 — impressions of..... 179
 — the study of..... 191
 Lechea minor..... 567
 Lee, W. W., article by..... 515
 Leeds, B. F., article by..... 21
 Legislation against injurious in-
 sects..... 457, 490
 — plant diseases..... 457, 621
 — forestry, proposed..... 11
 Leichten, Max..... 350
 — articles by..... 19, 224, 598
 Lemmon, J. G., article by..... 64
 Lemons in California, cultivation
 of..... 561
 Le Moyne, F. J., article by..... 286
 Lenten Roses..... 188
 Lepotes bicolor..... 148
 Lespedeza bicolor..... 112*
 — Sieboldii..... 112*
 Lettuce as a greenhouse crop..... 548
 Leucothoe recurva..... 376
 Liatris spicata..... 412, 416
 Libocedrus decurrens..... 214
 Library, the Tilden, site for..... 421
 Lichens, North American..... 276
 Licuala grandis..... 360
 Ligustrum Ibotæ..... 323
 — vulgare..... 572
 Lilac, Persian, blooming in au-
 tumn..... 544
 Lilacs, California..... 447
 — new double..... 72
 Lilies, Bermuda..... 180, 288
 — cultivation of..... 141, 269
 — hardy..... 462
 — in autumn..... 501
 Lilies-of-the-valley, varieties of..... 249
 Liliun auratum..... 463
 — macranthum..... 394
 — pictum..... 394
 — rubro-vittatum..... 394, 462
 — Wittei..... 394
 — Batemannæ..... 463
 — Brownii..... 269, 463
 — Chloraster..... 42
 — Canadense flavum..... 463
 — rubrum..... 463
 — candidum..... 312, 408, 463
 — Chalcedonicum..... 463
 — Columbianum..... 463
 — croceum..... 463
 — elegans..... 463
 — excelsum..... 463
 — giganteum..... 463
 — Grayii..... 257
 — Hansoni..... 462
 — Harrisii..... 463
 — Henryi..... 377
 — Humboldtii..... 462
 — Krameri..... 269, 463
 — longiflorum..... 143, 463
 — Formosanum..... 402
 — Lowii..... 42, 256
 — maritimum..... 462
 — Martagon..... 462
 — Hansoni..... 42
 — pardalinum..... 463
 — parvum..... 462
 — Philadelphicum..... 463
 — pomponium..... 462, 463
 — primum..... 220
 — pubescens..... 462
 — Pyrenaicum..... 462
 — speciosum album præcox..... 463
 — rubrum..... 463
 — sulfureum..... 462
 — Szovitsianum..... 462
 — tenuifolium..... 462
 — testaceum..... 463
 — Thunbergianum..... 463
 — tigrinum splendens..... 463
 — Wallacci..... 463
 — Wallichianum..... 462
 — superbum..... 301, 463, 480
 — Washingtonianum..... 462
 Lily, the Amazon..... 519
 — the Belladonna..... 512
 — the Kafir..... 92
 Limnanthus mun lacunosus..... 363
 Linnaria cymbalaria..... 345
 Lindelofia spectabilis præcox..... 210
 Lindens in Berlin..... 76
 Lindsey, N. A., article by..... 586
 Linen, home-made..... 311
 Lippia ligustrina..... 512
 — lycioides..... 630
 Liriodendron Tulipifera..... 207
 Lissochilus Græletii..... 413
 Listera convallarioides..... 424
 Lithospermum prostratum..... 68
 Llewellyn Park..... 578*
 Lobelia cardinalis..... 415
 — siphilitica..... 415

Lodeman, E. G., articles by... 175, 285, 321, 355, 493
Lonicera fragrantissima... 83
varieties of... 346
Lonsdale, Edwin, article by... 590
Lophospermum scandens... 104
Luculia gratissima... 6
Piceana... 6
Lycaste Youngii... 102, 129
Lychium Chalcedonica... 332
Lycium Chinesse... 570, 572
Lycopodium clavatum... 110
obscurem dendroideum... 110
Lyman, John D., paper by... 266
Lysimachia paridiformis... 184
Lythrum Salicaria... 347

[M]

Maackia Amurensis... 276
Macrozamia Dyeri... 497
Moorei... 497
spiralis... 497
Madrona, the... 238
of San Rafael, the great... 146*
Magnolia acuminata... 375
cordata... 508
conspicua... 209
foetida... 14, 82
Fraseri... 375, 388
Soulangeana... 525
stellata... 209
tripetala... 87
Manda, Joseph, Jr., articles by... 598, 622
Manettia bicolor... 153, 163
Mango, fruit of... 216
Mann, Charles L., articles by... 154, 190, 346
Manning, J. Woodward, articles by... 9, 538
Manzanita, flowering of... 178
Maple, the Sugar... 375*
Maples, Japanese... 255
Margotín, death of Jacques Julien... 300
Marica, species of... 582
Marion, Mass... 69
Masdevallia Cassiope... 433
falcata... 31
Harryana Gravesiæ... 497
Mundiyana... 31
leontoglossa... 341
Rolfæana... 31
Wendlandiana... 208
the genus... 239
Mashpee, Mass... 69
Massachusetts shore towns... 9, 69, 93
society for promoting agriculture, history of... 371
Massey, Prof. W. F., articles by... 33, 44, 68, 81, 103, 117, 128, 152, 189, 234, 261, 328, 366, 430, 512, 592
Mathews, C. W., article by... 62
Mattapoisett, Mass... 69
McMillan, Wm., paper by... 70
Mecynopsis Wallichii... 377
Medinilla magnifica... 213, 392
Meehan, Joseph, articles by... 45, 57, 358, 525, 611
Meehan, Thomas, articles by... 357, 611
Meeker House, Lyons Farms... 386*
Megarrhiza Californica... 503
Melianthus major... 344, 404
Melon, Beauty of Syon... 536
Menispermum Dauricum... 234*
Menyanthes in Penn... 314
Mertensia Virginica... 212
Mesembryanthemum crystallinum... 564
Michauxia campanuloides... 187
Microbes in plant-growth... 321
Microlopha lineare... 60
Middlesex Fells, Mass... 99
Mignonette, cultivation of... 151
Millsbaugh, Charles Frederick, article by... 345
Miltonia vexillaria Leopoldiana... 42
Sanderiana... 31, 42
Miltonopsis Bleui splendens... 129, 197*
Mimulus Douglasii... 178
moschatus... 84
Mohr, Dr. Charles, paper by... 507
Moles, remedy for... 576
Mollugo cerviana... 532
Monarda didyma... 415
fistulosa... 415
Monuments, proper placing of... 540
Moræa Robinsoniana... 42
species of... 582, 606
Morina longifolia... 9
Mormodes punctatum... 77
Morning Glory, a double... 480, 592*
Morningside plateau, New York... 243
Moss-agates, character of... 288
Moss, growing plants in... 188
Mount Desert, a foreigner's impression of... 530
Mulberry, an old... 529
Munson, W. M., articles by... 173, 453
Musa Ensete... 537
Martini... 537
Muscaria Scovitzianum... 212
Mushrooms, culture of, in winter... 624
a new species of... 590
diseases of... 123
Muskan, park at... 154
Myosotis palustris... 272
sylvatica... 110
Myrica asplenifolia... 45
cerifera... 45

Names for country places... 122
popular, for west American conifers... 227
Narcissus, Barr's, varieties of... 283
Bulbocodium... 188
Burbridgei, varieties of... 283
cernuus pulcher... 211*
Countess of Annesey... 270
cyclamenus... 209*
incomparabilis... 212*
Johnstoni... 271
Leedsii, varieties of... 283
poeticus... 308
maximus... 210*
minimus... 210*
monophyllus... 209*
poeticus ornatus... 308
radiflorus... 282
rugilobus... 270
rupicola... 213*
triandrus... 212*
trumpet maximus... 270
beds, permanent... 188
classification of... 209
cultivation of... 296
hardy... 270, 283, 382
Tazetta, natural varieties of... 283
Nature, beauties of... 599
love of... 193, 205, 218, 337
study for the common schools... 443
Naudin, Charles, articles by... 242, 326
Nebraska, shrubs and trees of... 46
Nelumbium nuciferum... 418
speciosum... 404, 418, 442
Nelumbuds in Central Park... 456
Nematodes in leaves... 224*
Nemisia strumosa... 390
Neobenthamia gracilis... 101
Nepenthes Chelsoni... 193
distillatoria... 103
Hookeriana... 103
Morganiana... 104
Rafflesiana... 104
Sedem... 104
in England... 556
Nepeta variegata... 572
Nerine pinnatifida... 42
Nettle, Stinging... 28
Neviusia Alabamensis... 232, 235
New Bedford, Mass... 69
Newberry, John Strong, death of... 600
New Hampshire, lakes and summer resorts in... 156
New Jersey building at the Columbian fair... 362*
Niagara Reservation, the... 575
Nicholson, Geo., article by... 159
Nicotiana colosea... 458
tomentosa... 488
Nomenclature, botanical... 98, 278, 362
North Carolina, shrubs in... 328
Novius Koebelei... 336
Nurseries at Forest Hill, England... 244
of Baron von St. Paul... 87
of Dr. G. Dieck, Zoeschen... 63
of L. Späth, Rixdorf... 87
of M. Croux, Sceaux, France... 543
of Messrs. Transon, Orleans, France... 544
Royal Exotic, Chelsea, England... 554
Waukegan, Ill... 274
Nuts and nut-growing... 624
Nutter, Frank H., article by... 119
Nymphaea alba candidissima... 284, 441
candida... 333
carnea... 442
Carolinensis... 332, 441
chromatella... 284
elegans... 418
exquisita... 441
gigantea... 332, 441, 477
Helveola... 441
Laydekeri rosea... 280, 354, 418
Lotus dentata... 441
Mariacuba alba... 332
carnea... 332
rosea... 354
Mexicana... 284, 441, 511
odorata... 284, 354, 363
gigantea... 332
sulphurea... 333, 354
pygmaea... 441
helveola... 354
rosca... 442
speciosissima... 284
Sturtevantii... 441
sulfurea... 441
Zanzibarensis... 284, 418, 441, 477
a new... 300
Nymphaeas, cultivation of... 177
warm water for tender... 515
Nyssa aquatica... 532
sylvatica... 375

O

Oak, the Black, a branch of... 50*
the Cork... 242
the Golden leaved, of California... 121*
the Live... 483*, 531
the Pin... 45
the Red... 564
the Tan Bark... 118, 517*
the White... 602

Oak, White, the Woodcock... 446*
at Basking Ridge, N. J... 576
at Shandy Hall, Md... 254*
Willow... 602
new hybrid... 527
the, trestle on... 287
Oaks, Scrub, borers in branches of... 557*
Valonia, attacked by caterpillars... 540
Oakesia puberula... 376
Odontoglossum Andersonianum pulcherrimum... 400
auriculatum... 485
Cooltadinum... 76
Edwardii... 102
Godsefianum... 77
Imshootingianum... 77
gutatum... 485
Owenianum... 510
Pescatorei Lindenae... 209
platycheilum... 257, 400
ramosissimum... 102
Rossii... 163
Wendlandianum... 222
Odontoglossums, new... 31
Odontospermum pygmaeum... 506
Oenothera Missouriensis... 332, 416
ovata... 178
Oil-making in Italy... 484
Okra for coffee... 568
Olea fragrans... 544, 592
Oleanders in North Carolina... 328
Olmsted, A. H., article by... 574
Omphalodes verna... 260, 272
Oncidium Gravesianum... 413
Phalænopsis... 102
Rolfæanum... 497
Onion seedlings, transplanting... 48
Onions, cultivation of... 430
in Oregon... 576
Ononis Natrix... 160
rotundifolia... 160
Opuntia Rafinesquii... 403
Orange, hardness of the Satsuma... 103
Oranges, Californian... 561
Mandarin, in San Francisco... 624
Orchard, fungus diseases in... 526
spraying... 370
Orchards, maintaining fertility in... 58
Orchidaceous plants, manual of... 258, 554
Orchids, albino... 142, 299, 395, 454
at Eden Musée, N. Y... 119
at North Easton, Mass... 128
at Short Hills, N. J... 119
at St. Albans, Eng... 521, 522
in London... 293
in New York City... 120
Swan's-neck... 88
Orcutt, C. R., article by... 183
Orleans, Mass... 292
Orobos vernus... 260, 270
Orontium aquaticum... 220, 363
Orpet, E. O., articles by... 9, 31, 79, 103, 141, 150, 188, 211, 224, 248, 270, 283, 296, 320, 344, 381, 382, 404, 416, 452, 462, 476, 488, 544, 549, 559, 584, 620.
Ostrya carpinifolia... 602
Othonna crassifolia... 573
Oxalis acetosella... 424
asinina... 524
breviscapa... 392
crispata... 524
fabaeifolia... 524
flabellifolia... 524
flava... 524
grandiflora... 392
hirta... 452
hirtella... 452
lancaefolia... 524
leporina... 524
linifolia... 524
macrostylis... 452
multiflora... 452
punctata... 524
purpurea... 392
rosacea... 452
rubella... 452
variabilis... 392
versicolor... 392
the Cape... 392, 452, 524
Ozark Mountains, Mo., botany of... 525

P

Paeonia lutea... 324
tenuifolia... 251
Paeonies, herbaceous... 287, 330
Palm, Parapee... 204
Palms and Tree Ferns at the Columbian Exposition... 494
in California... 514
for shady windows... 597
raising, from seed... 43
Pandanus Baptistii... 550
Panicum variegatum... 564
Papaver bracteatum... 296
nudicaule... 260, 272
Papyrus Antiquorum... 188, 536
Pardanthus Chinensis... 394
Paris, flower-tender of... 275, 279, 312
Jardin des Plantes... 206
Park at Coblenz... 554, 598
at Muskau... 123
at Wakefield, Mass... 411
Brockwell, London... 336
Central, speed-road in... 109, 145, 181
commission, Boston, Metropolitan... 62, 421

Park facilities... 458
Highland, Jamaica, N. Y... 528
Llewellyn... 578*
Monceau, Paris... 206
Petit Trianon... 231
Phoenix, Dublin... 392
state, in New Hampshire... 312
Vernon, Philadelphia... 357
Yellowstone... 120, 181
Yosemite National... 74
Parkinsonia aculeata... 580
Parks for growing cities... 61
for Providence, R. I... 528, 590
in London... 360, 616
in Washington... 204
national... 613
New England... 27, 99, 590
of New York... 132, 144, 420
public... 542
need of... 131
status in... 470
Parrotia Persica... 207, 293
Passaic, N. J., autumn flowers at... 453
Passiflora lutea... 418
Paulownia imperialis... 449
Pavetta Borbonica... 392
Peach, a Chinese... 438*
orchards, cultivation of... 600
Peaches in North Carolina... 366
Peach-trees, protecting fruit-buds of... 516
Pear, anthracnose of... 201
Beurre Giffard... 480
Edmonds... 372
Pear-midge... 490, 601
psylla... 285, 612
Pears, new... 414
Pearson, A. W., articles by... 118, 130, 154, 165, 178, 597, 618
Peas, early... 68
Sweet... 152, 190, 456
Mr. Eckford's... 390
Pelargonium, L'Elegante... 573
Lisbeth Moncorps... 396
Zonal, Double New Life... 536
Madame Bondeville... 536
Raspail Improved... 536
Pelargoniums, blights of variegated... 353*
in England... 570
Ivy leaved... 573
Zonal... 582
Pellexia Travassosii... 244
Wendlandiana... 244
Pellexia bella... 465
rotundifolia... 465
Pennisetum longistylum... 150, 418, 477
Peromia maculosa... 597
Pepero, the... 95, 173*
Perfumery, manufacture of... 340, 540
Peristeria aspersa... 31
Lindeni... 394
Persimmons, Japanese... 342
Peru, art in... 311
Peters, Rev. John E., article by... 194
Petit Trianon, park of... 231
Petunia blight... 141
Petunias, cultivation of... 112
Phacelia fimbriata... 388
Purshii... 126
Phajus Cooksonii... 364
grandifolius in a window-garden... 186
maculato-grandifolius... 31, 462
tuberculatus... 304
Phalænopsis Amphitrite... 412
Artemis... 497
Brymerianum... 378, 497
Schulleriana... 102
purpurea... 102
cultivation of... 545
Phillips' estate, Beverly, Mass... 145*
Philpott, Henry J., paper by... 351
Phlox bifida... 448
divaricata... 448
glaberrima... 448
herbaceus... 448
maculata... 474
paniculata... 448
pilosa... 448
subulata Sadie... 288
Triomphe du Parc de Neuilly... 441
Phococophorium... 498
Phormium tenax... 537
Phrynum variegatum... 520
Phygellus Capensis... 525
Phylanthus Roseo-pictus... 536
Physalis pubescens... 103
Picea Breweriana... 506, 591*
Morinda... 603
pungens... 274
Picotee, Douglas's Favorite... 390
Pike, Mrs. M. H., articles by... 459, 471, 483
Pilocarpus pennatifolius... 257
Pimelia spectabilis... 223
Pinchot, Gifford, article by... 104
paper by... 393
Pine, the Bull... 184
the Lobelley... 73
the Long-leaf... 73*, 592
the Long-leaf, effects of boxing on... 120
the Old Field... 73
the Red... 274
the Sugar... 1, 214
the White... 76
for timber... 609
in Canada... 600
the Yellow... 214
an old, in Japan... 360

- Pine Bank, Boston..... 446
 — burrens, winter rambles in, 16, 74, 110
 — forest in Lower California..... 183*
 — forests, waste from..... 482
 Pines at Kew..... 603
 — from seed..... 302
 — in Florida..... 73*
 — number to the acre..... 266
 — serotinous..... 160
 — the, climbing plants in..... 400
 — the, edible fruits in..... 435
 — the, late autumn in..... 567
 — the, spring in..... 220
 Pinetum at Wellesley..... 385
 Pinus albicaulis..... 2
 — attenuata..... 65
 — Ayacahuite..... 2
 — Bonapartea..... 2
 — Californiana..... 64
 — clausa..... 160*
 — Cubensis..... 73*
 — excelsa..... 1
 — flexilis..... 1
 — Jeffreyi..... 231
 — — peninsularis..... 184*
 — Lambertiana..... 1, 214
 — Laricio, in Norway..... 231
 — latifolia..... 111
 — monophylla..... 184
 — Monticola..... 1*
 — Parryana..... 183
 — parviflora..... 1
 — ponderosa..... 214
 — Strobus..... 266
 — — in Scandinavia..... 230
 Plank, E. N., articles by..... 399, 531, 579
 Plantago media..... 550
 Plantains..... 183
 Plant-diseases..... 345, 457
 Plant-house, a tropical..... 383
 Plant-labels..... 405
 Plant-names, local, in New Jersey..... 395
 Plants, annual..... 488
 — bedding..... 225
 — Californian, new..... 430
 — climbing..... 91*, 432, 509*
 — extermination of..... 516
 — foliage..... 537
 — for summer decoration..... 536
 — fragrance of..... 180
 — half-hardy..... 358
 — hardy..... 439
 — — at Passaic, N. J..... 286
 — — at Short Hills, N. J. 215, 394
 — herbaceous..... 272, 307, 332, 352, 476, 500
 — in connection with
 — buildings..... 26*, 509*
 — propagation of..... 620
 — indoor..... 544, 572
 — perennial autumn-blooming..... 464
 — — from seed..... 79
 — pestiferous..... 348
 — tender, protection of..... 234
 Platyclis Cobbiana..... 596
 Pleroma macrantha..... 587
 Pleurothallis subulata..... 485
 Plumb, Prof. C. S., article by..... 417
 Plumbago Capensis..... 428
 — white..... 491
 — Larpentea..... 440, 464
 — rosea..... 609
 Plum-flower blight..... 248
 — tree, black knot on..... 621
 Plums, cultivated native..... 358
 Podophyllum peltatum..... 376
 Poe's Cottage at Fordham, N. Y..... 134
 Polemoniaceæ of the Lake Region..... 448
 Polemonium reptans..... 448
 Polygonatum giganteum..... 376
 Polypodium vulgare Cambricum..... 504
 Pomegranates in North Carolina..... 328
 Pontederia cordata..... 363
 Poplars, American..... 277
 Poppies, new..... 163
 — oriental..... 273
 Poppy, Golden Gate..... 163
 — Iceland..... 272
 Populus angustifolia..... 278
 — balsamifera..... 277
 — Fremontii..... 278
 — grandidentata..... 278
 — heterophylla..... 278
 — monilifera..... 277
 — tremuloides..... 277
 — trichocarpa..... 277*
 Porana paniculata..... 303
 Potato-flour..... 588
 — rot and Bordeaux mixture..... 486
 — scab, check for..... 108
 Potatoes, cultivation of..... 623
 Potentilla Canadensis..... 220
 — simplex..... 220
 — fruticosa..... 616
 — glabra..... 136
 Powell, E. P., articles by..... 33, 56, 80, 125, 128, 210, 248, 260, 272, 316, 342, 367, 512
 Powell, George T., paper by..... 71
 Prairies, late summer flowers on..... 412
 Pratt, H. G., articles by..... 454, 598
 Prentiss, A. N., article by..... 52
 Primroses, cultivation of..... 212, 269
 Primula cortusoides..... 211, 249
 — denticulata nivalis..... 211
 — floribunda..... 19
 — Forbesii..... 341
 — imperialis..... 42, 100
 Primula Japonica..... 40, 270
 — Oakwood Blue..... 269
 — obconica grandiflora..... 417
 — Poissonii..... 42
 — rosea..... 213, 236
 — Sieboldi..... 168, 177
 — Sinensis..... 165, 343
 Privet, ornamental fruit of..... 572
 Propagating-beds, galvanized iron for..... 57
 Prosopis juliflora..... 83, 532
 Provancher, Abbé Léon, death of..... 264
 Prunella grandiflora..... 159
 Prunes in California..... 12, 444
 Pruning grape-vines..... 612
 — street-trees..... 589
 — trees..... 485
 Prunus Avium..... 256
 — Caroliniana..... 469, 592
 — Davidiana..... 207, 326
 — Grayana..... 343
 — hortulana..... 90
 — humilis..... 511
 — ilicifolia..... 469*
 — Jacquemontii..... 510
 — Japonica..... 255
 — Laurocerasus..... 469
 — Myrobalana..... 64
 — pendula..... 255, 343
 — Pennsylvanica..... 343
 — Pissardi..... 270
 — Pseudo-Cerasus..... 255
 — serrulata..... 255
 — Sieboldii..... 255
 — tomentosa..... 343, 580*
 — Virginiana..... 135
 — Wateri..... 255
 Pseudotsuga taxifolia..... 76
 — — in Scandinavia..... 230
 Psidium rotundifolia..... 516
 Pteris Cretica Mayii..... 308
 — nobilis..... 308
 — scaberula..... 464
 — serrulata cristata densa..... 308
 — tremula Smithii..... 308
 — Victorieæ..... 308
 Pterostyrax hispidum..... 389*
 Ptychoraphis angusta..... 377
 Pulmonaria saccharata..... 284
 Pultenœa flexilis..... 223
 Punica Granatum nana..... 511
 Purdy, Carl, articles by, 118, 177, 430, 538
 Pyrethrum uliginosum..... 464
 Pyrethrums, propagating..... 103
 Pyrrhopappus Carolinianus..... 220
 Pyrus arbutifolia..... 436, 572
 — baccata..... 264
 — coronaria..... 264
 — — Iœnsis, double-flowered..... 252
 — Halliana..... 264
 — Parkmanni..... 264
 — prunifolia..... 264
 — spectabilis..... 264
 Quercus ægilops..... 540
 — alba..... 254*
 — Brittoni..... 527
 — ceris..... 602
 — chrysolepis..... 121*
 — conferta..... 602
 — densiflora..... 517*
 — falcata..... 98, 312
 — ilicifolia..... 527
 — Kelloggii..... 98
 — Mirbeckii..... 326
 — nigra..... 527
 — palustris..... 45
 — pedunculata..... 602
 — Phellos..... 602
 — Robur..... 602
 — sessiliflora..... 602
 — tinctoria..... 50*, 98
 — Virginiana..... 483*
 Quince-fruit, decay of..... 477
 Radish-seed, sowing..... 128
 Raisins in California..... 268
 Ranunculus acris..... 273
 — cortusa-folius..... 174
 Raspberries, cultivation of..... 260, 458
 — in autumn..... 272
 Raspberry crop of 1892..... 367
 Rea, Charles H., article by..... 177
 Redwood, the..... 237, 502
 Regel, Edward von, death of..... 252
 Reinwardtia trigynia..... 585
 Renanthera Inschodtiana..... 31
 Restrepia Ecuadortiana..... 485
 — Shuttleworthii..... 485
 — striata..... 31, 257
 Retinosporas, winter-killing of..... 215
 Reverchon, J., articles by..... 172, 615
 Review of American Woods..... 588
 — Annals of Horticulture in North America for 1891..... 454
 — Beauties of Nature, the..... 599
 Review: Botany for children, short studies in..... 623
 — Chemicals and Clover..... 143
 — Concord, old: her highways and by-ways..... 623
 — Cone-bearers, a Hand-book of West American..... 227
 — Dictionary of Botanical Terms..... 491
 — Economic Fungi..... 455
 — Electricity in Agriculture..... 47
 — Field-Farings..... 563
 — Fleurs, à Paris: Culture et Commerce..... 275
 — Flowers of Japan and the art of floral arrangement..... 22, 35
 — Folk-lore, Journal of American..... 575
 — Foot-path Way..... 503
 — Forsliche Botanik..... 335
 — Fruit-culture..... 491
 — Garden Design and Architects' Gardens..... 467
 — Irideæ, a Hand-book of..... 581
 — Leaves, the Study of..... 191
 — Masdevallia, the genus..... 239
 — Massachusetts Society for Promoting Agriculture..... 371
 — Missouri Botanic Garden, report of..... 311
 — Nature in Ornament..... 167
 — — Study for the Common Schools..... 443
 — Oak, the: a Popular introduction to Forest-botany..... 287
 — Our Trees..... 107
 — Plant World, its Past, Present and Future..... 191
 — Plums and Cherries, the cultivated native..... 358
 — Potager d'un Curieux, Le..... 419
 — Rescue of an Old Place, the..... 179
 — Silva of North America, the..... 83, 346
 — Traité des Arbres et Arbrisseaux, Forestiers, Industriels et d'Ornement, Cultivés ou Exploités en Europe et plus particulièrement en France, etc., etc., etc..... 263
 — Trees and Shrubs of Nebraska, Preliminary Report on the..... 46
 — Trees of the Northern United States..... 431
 Rhodochiton volubile..... 428
 Rhododendron arboreum..... 353
 — campylocarpum..... 209
 — Catawbiense..... 376
 — Fortunei..... 186
 — fulgens..... 209
 — linearefolium..... 186
 — maximum..... 543
 — nudiflorum..... 354
 — occidentale..... 503
 — parvifolium..... 222
 — racemosum..... 222, 510
 — rhombicum..... 186
 — scaberrimum..... 150
 — Ungerni..... 64
 — Vaseyi..... 354
 — viscosum..... 336, 354
 Rhododendrons at Knap Hill..... 304
 — Chinese..... 185
 — hybrid Java..... 234, 555
 — in the Alleghanies..... 334
 Rhus Metopium..... 83
 — microphylla..... 615
 — semialata..... 396
 — Toxicodendron..... 46
 — venenata..... 46
 — Vernix..... 83
 Ribes prostratum..... 388
 — sanguineum..... 225
 Richardia Æthiopica..... 587
 — aurata..... 617
 — Nilotica..... 618
 Richea pandanifolia..... 364*
 Ridgway, Robert, article by..... 202
 Road through a Chestnut Wood..... 566*
 Roadside shrubberies..... 613*
 Road-sides, dangers to..... 361
 Roads, good..... 326
 — on Cape Cod..... 574
 Robbins, Mrs. J. H., articles by..... 27, 99, 122, 189, 231, 290, 302, 321, 326, 338, 405, 434, 590, 624
 Roberts, Prof. I. P., paper by..... 58
 Robinia Neo-Mexicana..... 300
 — viscosa..... 15, 360
 Robinson, W., article by..... 197
 Rock-garden at Kew..... 426*
 — plants..... 260, 272
 Rodriguezia Lindenii..... 268
 Rolfe, R. A., articles by..... 4, 76, 88, 148, 172, 243, 256, 268, 400, 412, 485, 497, 510
 Romulea, species of..... 582
 Roof-gardens at Chicago..... 336
 Rosa Carolina..... 368, 572
 — foliolosa..... 384
 — grandiflora..... 276
 — Hardyi..... 507
 — kevigata..... 162
 — lucida..... 46, 368
 — pomifera..... 304
 — rugosa..... 267, 269, 280, 287
 — setigera..... 336, 348, 360, 368
 — tomentosa..... 615
 Rosa Wichuraiana..... 367
 Rose, American Beauty, sport of..... 500
 — Belle..... 539, 550, 551, 563
 — Bride..... 516
 — Cornelie Koch..... 429
 — Crimson Rambler..... 330
 — Duchess of Albany..... 598
 — Empress Augusta Victoria..... 429
 — Golden Gate..... 429
 — Gustave Piganeau..... 395
 — Hugh..... 84
 — Kaiserin Augusta..... 539
 — La France..... 598
 — Madame Alfred Carrière..... 267
 — Caroline Testout..... 500, 539
 — Georges Bruant..... 267
 — Meteor..... 539, 551
 — Mrs. John Laing..... 516
 — Mrs. William C. Whitney..... 539, 551
 — polyantha..... 280
 — Mathilde Souper..... 585
 — remontant..... 184
 — Turner's Crimson Rambler..... 492
 — Waban..... 240, 429
 — a new Hybrid..... 460*
 Rose Hill Nurseries..... 346
 Rose, N. J., article by..... 55
 Rose-sports..... 251
 Roses at Nice..... 314
 — cultivation of..... 126, 260, 368, 429, 500
 — diseases of..... 406
 — favorite in England..... 480
 — hardy ever-blooming..... 525
 — hybrid, propagation of..... 620
 — in California..... 454, 598
 — new strain of..... 184
 — standard..... 187
 — Tea, varieties of..... 474
 — the season of..... 279
 — twelve best..... 456
 Rosemary, uses of..... 336
 Rubus Millspaughii..... 144, 424
 — phenoclasius..... 66, 270
 Rudbeckia laciniata..... 403
 — maxima..... 403
 — speciosa..... 394, 403
 — subtomentosa..... 394, 440
 Rudgea macrophylla..... 392
 Rumex, species of..... 228
 Ruscus aculeatus..... 250
 Russian fruits..... 483
 Rust, the Carnation..... 18*
- Sabal Blackburniana..... 552
 — Palmetto..... 73, 158, 189, 215
 Saggiitaria Japonica..... 404
 Saggiitarias in New Jersey..... 363
 Salix adenophylla..... 75
 — glaucophylla..... 75
 — humilis..... 75
 — tristis..... 75
 Salvia argentea..... 212
 — patens..... 420
 Sanchezia nobilis variegata..... 537
 San Diego, remarkable plants in..... 514
 Sandy soil, plants for..... 75, 190
 San Salvatore Mt., a visit to..... 280
 Sansevieria Zeylanica..... 507
 Santa Monica, forest experiment station at..... 262
 Sanvitalia procumbens..... 516
 Sapidus acuminatus..... 432
 Sargent, Prof. C. S., articles by..... 52, 138, 243, 256, 268, 304, 438, 524
 Sarracenia Farnhamii..... 414
 Sarracenas as flowering plants..... 196
 Saxifraga Camposii..... 104
 — cuscutelormis..... 104
 Scenery, defacement of..... 577, 622
 — preservation of natural..... 229
 Schizocodon soldanelloides..... 174
 Schizophragma hydrangeoides..... 183
 Schizostylis coccinea..... 92
 Schomburgkia Sanderiana..... 31
 Sciaoptys verticillata..... 172
 Scilla bifolia Whittalii..... 212
 — campanulata..... 272, 284
 Scoliopus Bigelowii..... 178
 Seaforthia elegans in California..... 514
 Sea-shore, plants for..... 45
 Sedges, ornamental value of..... 514
 Sedum acre..... 296
 — spectabile..... 440
 — Telephium..... 615
 Seed-farms, labor on German..... 120
 Seed-raising in Germany..... 111
 Seeds, vegetable, home-grown..... 130
 Selaginella Kraussiana..... 597
 — rupestris..... 110
 Senecio Galpini..... 303
 — Japonicus..... 416
 — macroglossus..... 294*
 — mikanioides..... 573
 Senecios of the Canary Islands..... 44
 Seliger, Mrs. Wilhelmine, articles by..... 214, 358, 395, 442
 Sequoia gigantea..... 237, 541*, 603
 — in Scandinavia..... 230
 — Reservation..... 193
 — sempervirens..... 237
 Shad-bush, the western..... 409*
 Shepherdia Canadensis..... 74

Shinn, Charles Howard, articles by .74,
106, 402, 561, 611, 622
Shongum Mountains 459, 471, 483
Shore-towns of Massachusetts 9, 69, 93
Shortia galacifolia 270
Short Hills, *Chrysanthemums* at 526
Shrubs, roadside 613*
Shrubby, an evergreen 15
Shrubs at the Arnold Arboretum 225,
249, 282, 318, 330, 343, 353, 367, 390, 402,
571, 580
— for a screen 442
— for forcing 174
— half-hardy, effect of winter
oil 225
— in Europe 263
— in North Carolina 328
— in Texas 615
— in wet soil 81
— native, of California 426, 447
— notable, in late Novem-
ber 571
Sierra Club, San Francisco 348
Silene Armeria 416
— alba 416
Silphium laciniatum 403
— perfoliatum 403
— trifoliatum 403
Silya of North America 83, 349
Skimmias 443
Slade, D. D., articles by 238, 604
Small fruits, cultivation of 12
Smilacina racemosa 296
Smilax glauca 424*
— Pseudo-China 52*, 208
— Walteri 83
Smith, Prof. John B., articles by 117,
490, 557
Smoke-tree, American 83
Snowdrops, autumn 33
Snow scenes 562
Sobralia Lowii 389
— Lucasiana 329
— macrantha Kleinastiana 31
Sobralias, cultivation of 356
Soils, potting 31, 549
Soja hispida 419
Solantra grandiflora 92
Solanum capsicastrum 587
— ciliatum 488, 587
— heterodoxum 532
— jasminoides 163, 429
— grandiflorum 444
— muricatum 95, 173*
— Pseudo-capsicum 328
Solidago caesia 464
Sonerila Hendersoni 573
Sophora Japonica 602
— secundiflora 580
Sophoro-Cattleya Veitchii 461
South Africa, fruits from 116, 148
Southern country-seat, the old 459
Spathoglottis Ericssonii 459
— Kimballiana 129
— Viellardi rubra 556
Speed-road in Central Park, the
proposed 109, 145, 181
Spice-bush, the, as an ornamental
plant 432
Spiraea Aruncus 308, 372, 431
— astilboides 308
— Billardii 315, 328
— Bumalda 315
— callosa 315
— Cantoniensis 255, 282
— filipendula 308
— Lindleyana 15
— lobata 480
— prunifolia 282, 492
— sorbifolia 315
— Thunbergii 282, 544
— tomentosa 372
— Van Houttei 255, 282
Spiranthes olivacea 485
— Romanzoviana 616
Spraying Grape-vines 519
— in orchards 204, 310, 370
— machines and insecticides 203
Spring's onset 142
Spruce, the Colorado blue 274
— the Douglas 182, 275
— the Norway 171
— the Weeping 506, 591*
— the White 274
Spruce-bud louse 64
Spruces on the coast of Maine 97*
St. Paul, Baron von, nurseries
of 87
Stachys affinis 84, 419
— Stebboldii 84, 419
— tubrifera 84, 419
Stanton, G., article by 223
Staphylea Colchica 242, 267
— trifoliata 232
Statice Halfordii 585
Statues in parks 470
Stauroopsis lissocauloides 389
— Warocqueana 268
Stellaria Holostea 285
Stenoglottis longifolia 31
Stephanandra flexuosa 225
Stephanotis floribunda 429
Stepvensonia grandifolia 497
Stigmaphyllon ciliatum 429
Stock and graft, mutual influence
of 315
Stocks, cultivation of 111
Stokesia cyanea 464

Stove and greenhouse plants 40
— plants 392
Strawberries, abortive 355
— a selection of 210
— early 68
— and late 622
— for the garden 186, 235
— in autumn 272
— loss of vigor in 246
— old and new 379
— propagating new 570
Strawberry, Hoffman 336
Strawberry-beds, wintering 537
Streams, the flow of, and forests 70
Street-trees, pruning of 589
Streptocarpus Galpini 42, 197
Strong, Wm. C., article by 57
Stuartia pentagyna 336
Styrax Americana 318
— Japonica 318
Sub-irrigation in greenhouses 504
Suburban place, story of a 134, 158
Sudworth, George B., articles by 98, 160
Sugar-cane, seeding of 264
Summer decoration, plans for 516
— houses, colonial 63*
Swamp, a reclaimed 494*
Sweet Alyssum 251
Switzerland, holiday notes from 3, 159
Symphoricarpos racemosus 587
— vulgaris 572
Symplocos crataegoides 90*
Synandropadix vermitoxicus 341
Syringa Japonica 324

T

Tacsonia mollissima 617
— Smythiana 462, 616
— Van Volxemii 429
Tagetes signata 621
Tamarisks, late-blooming 396
Taplin, James, death of 24
— W. H., articles by 43, 67, 104,
126, 163, 203, 225, 260, 308, 319, 343, 392,
429, 441, 464, 489, 500, 524, 537, 558, 572,
596
Taste indoors and out 373, 433
— questions about 495
Taxodium distichum 232
Taxus baccata 455
Tea plantation in North Carolina 592
Tecoma australis 163
— grandiflora 384
— radicans 384
Ten-mile woods, Hartford 442
Terrace at Haddon Hall 326*
Teucrium montanum 159
Texas, botanical notes from 399, 531, 579
— shrubs of 615
Thaw, the January 49
Thorn, the Cockspar 217
— the Washington 218
— the White 217*
Thriffs, cultivation of 9
Thrinax elegans 66
— Morrisii 42, 66
Thunbergia erecta 560
— latifolia 163
Thunia Mastersiana 31
— Veitchiana 329
Thuya gigantea in Scandinavia 230
Tiarella cordifolia 110
Tigrida, species of 582
Tilia argentea 124
Timber-culture in eastern Nebraska
lands, public 189
— trees of West Virginia 559
— White Pine for 609
Todaro, Baron, death of 360
Todea Africana 465
Tomato diseases 108, 175, 379, 465
Tomatoes as a summer greenhouse
crop 487
— cultivation of 33
— from immature seed 201
— varieties of 81
Torenia Asiatica 559
— Fournieri 430
Torreya nucifera in Germany 172
Toxicophlea spectabilis 32, 204
Trachymene coerulea 416
Tridesantia Warszewicziana 404
Treat, Mrs. Mary, articles by 292,
303, 400, 435, 567
Tree butchers 589
— cultivation by the Canadian
government 276
— planting 2, 169, 552
— by children 530
— in Highland Park, Ja-
maica, N. Y 528
— pruning 330, 485, 589
— value of a 110
Trees and city officials 107, 589
— and shrubs of Nebraska 46
— at Morrisville, Pa 348
— coniferous, from seed 274
— cutting, in Yosemite Val-
ley 350
— forms of 322, 334
— in California 72
— in Europe 263
— in Hamburg 171

Trees in Indiana 240
— in October 505
— in spring, the beauty of
our 265
— in winter, the aspect of 50*
— large, in England 552
— love of 230
— of Salem, Mass 107
— of the northern United
States 431
— propagation of 623
— self-supporting 538
— spring coloring of foliage 240
— surplus, in Central Park 350
— teachings of 85, 340
— transplanting large, orna-
mental 120
Trichodesma physaloides 107
Trichophila laxa 166
Tricker, Wm., articles by 44, 104,
116, 177, 354, 494, 539
Trillium grandiflorum 272
— ovatum 178
— sessile 178
Tritonia aurea 582
— Templemanni 617
Trolius Europaeus 624
Tropical plants at Saxoville, Mass 383
Tulbaghia Natalensis 42
Tulip, Flag of Truce 163
— show in England 324
Tulips, species of 224
— varieties of 239
Turner, W. S., paper by 548
Typha angustifolia 303
— latifolia 303

U

Ulex Europaeus 226
Umbellularia Californica 238, 349*
Ungnadia speciosa 532
Unter den Linden, trees on 76
Urceocharis Chibrani 432
Urceolaria pendula 609
Uromyces caryophyllinus 18*
Urtica dioica 228
Utricularia clandestina 363
— Humboldtii 113
— inflata 363
— purpurea 363

V

Vail, Miss Anna Murray, articles
by 364, 375, 388, 395, 424, 436
— Hugh D., article by 179
Valeriana officinalis 267
Van Deman, H. E., article by 11
Van Rensselaer, Mrs. Schuyler, arti-
cles by 146, 195, 446, 465, 574
Van Slyke, Prof. L. L., paper by 90
Vanda Arbutnotiana 256
— Sanderiana 450
— vitellina 510
Varieties, deterioration of 21
Vegetables, cultivation of 92, 261,
366, 512
— little-known of Texas 419
Veltheimia viridifolia 104, 165
Verbena Aubletia 166
Vernon Park, Philadelphia 357
Vernonia altissima 500
— Arkanasana 500
— Noveboracensis 500
Veronica gentianoides 285
— incana 332
— longifolia subsessilis 439
— repens 252
— spicata 159
— Virginica 439
Viburnum cotinifolium 243*
— dilatatum 318
— lantanoides 318
— Opulus 516, 572
— prunifolium 251
— tomentosum 87, 319
Vicia Narbonensis 100
— sylvatica 159
Victoria regia, cultivation of 311
Vilmorin, Henry L. de, paper by 314
Vinca minor 272
— variegata 597
Vineyards in New York 424, 459
— of California, disease in 566
Viola canina 220
— cucullata 220
— delphinifolia 220
— Frau Hof Garten-direktor
Jülke 144
— pedata 166, 180, 220
— sagittata 220
Violas, hybrid 19
Viols, Bird's-foot, in cultivation 226
— disease of 381, 417
— in Virginia 364
— varieties and cultivation of 176
Vitex Agnus-castus 328
Vitis rugosa 326
— vinifera 618

Vriesea hybrida pommer Eschena 360
Vroom, J., article by 299

W
Wathoo, the 555
Wacorn, Miss C., articles by 226, 298,
309, 351, 530
Wahlenbergia undulata 42
Wakfield, Mass., pleasure-ground 411
Wall, Mrs. Louise Herrick, article
by 57
Wareham, Mass 69
Washington's headquarters, Mor-
ristown, N. J 363*
Waste from Pine-forests 482
— products made useful 540
Water-gardens 82, 177, 283, 310, 320,
332, 354, 404, 418, 439, 441, 456, 577, 494*
Water-lilies, winter-flowering 44
Water-lily, a new 280
Water-melon, test of ripeness 600
Water-plants in southern New Jer-
sey 363
Water-towers in Massachusetts 410
Watrous, C. L., article by 453
Watson, Sereno, death of 121, 220
Watson, W., articles by, 4, 30, 40, 54, 66,
78, 102, 113, 136, 148, 174, 184, 196, 208,
222, 257, 293, 294, 317, 329, 364, 377, 389,
400, 413, 426, 439, 485, 497, 510, 529, 534,
545, 556, 561, 568, 581, 604, 616.
Watsonia densiflora alba 42
— species of 582
Waukegan nurseries 274
Waverley Oaks, by bicycle to 374, 386
Wayside flowers 153, 163
Weathers, John, articles by, 117, 151, 419
Weeds, ornamental plants be-
coming 615
— in southern New Jersey 292
— manual value of 96
— study of 96, 191, 348, 468, 576
Wellesley, flowers at 586
— gardens 298, 338
— punctum 385
Wesmael, Alfred, article by 286
West Virginia, notes from, 15, 100, 186,
232, 254, 267, 279, 292, 315, 328, 340, 352,
520, 532, 544.
— plant: diseases in 345
— timber-trees of 155
White Mountain forests, preserva-
tion of 517, 565
Whitman, Miss Amy, article by 163
Whittall, Edward, paper by 465
Whorl-flower, hardness of 9
Wild flower exhibition at Edinburgh 382
Wild flowers on Long Island 312
Wild-garden at Clifton, N. J 310
— in August 403, 415
Williams, E., articles by 11, 546
Willow-tree in Waterbury Centre,
Vermont 588
Willow-trees in the Pine-barrens 75
Wind-breaks, value of 56
Windows, plants for 572
Wineberry, Japanese 66
Winter-killing of trees and shrubs 272,
299
Winter protection of plants 234, 584
Wistaria multijuga 300
Wistarias in Mass 331
Witch-hazel, the 555
Wood Waxen 331
Women as landscape-architects 482
Wood-ashes, grades of 492
Woods, American 588
Woodlands, danger of fire in 170
— observations in 125
Woolson, George C., paper by 618
Wright, Mrs. Floy L., article by 375

X

Xyris 363

Y

Yellowstone Park, legislation for 204
— boundaries of 241
— Company 98, 120
Yew-trees in Normandy 288
Yosemite national park 74
— cutting trees in 350
Yuccas, blooming of, in W. Va 315
— late-blooming 624

Z

Zamia integrifolia 208
Zinnias, blooming of 474
Zygo-Colax Veitchii 129
Zygotetrum graminifolium 510
— intermedium 596

ILLUSTRATIONS.

<p>A</p> <p>Amelanchier alnifolia..... 415 Aristolochia Siphon..... 509 Ascyrum Crux-Andreæ..... 257 Aster amethystinus..... 378 —— sericeus..... 473</p> <p>B</p> <p>Beans, diseased..... 620 Begonia Baumannii..... 77 —— Gloire de Lorraine..... 247 Boltonia latifolia..... 271</p> <p>C</p> <p>Cedars on Mount Lebanon..... 607 Celastrus scandens..... 569 Chrysanthemum, Golden Wedding..... 559 —— Walter Hunnewell..... 17 Clematis brevicornata..... 139 —— paniculata..... 91 Columbian Fair Grounds, plan of.. 291* Corylopsis pauciflora..... 342 Crataegus mollis..... 221 Cyclamen, a double-flowered..... 235 —— proliferous flower of..... 235 Cypripedium Chamberlainianum... 413 —— Daisyæ..... 463 —— Warnero-superbiens..... 511</p> <p>D</p> <p>Dendrobium chrysothecum..... 533 —— Phalaenopsis..... 440</p> <p>E</p> <p>Egg-plant seedlings destroyed by fungus..... 164 Elm at Derby Line, Vermont..... 307 Erica hycnalis..... 137</p> <p>F</p> <p>Flowers, perforation of, by insects. 29</p>	<p>G</p> <p>Galax aphylla..... 605 Garden, a Japanese..... 175 Grape-flower, opening bud of..... 451 —— pistil and stamens of..... 451 —— the Lindley, clusters of..... 451 Greenhouse, section of..... 8</p> <p>H</p> <p>Haddon Hall, terrace of..... 329 Halesia tetraptera Meehani..... 535 Hemlocks in winter..... 41 Herbaceous plants in connection with buildings..... 32 Hypericum opacum..... 305</p> <p>I</p> <p>Ipomoea purpurea, a double..... 593 Islay, the..... 475</p> <p>J</p> <p>Jacobinia magnifica..... 317 Japanese garden, a..... 175</p> <p>K</p> <p>Kew, rock-garden at..... 427 —— the temperate house at..... 401</p> <p>L</p> <p>Laurel, the California..... 355 Leaf attacked by nematodes..... 224 Lespedeza bicolor..... 114 —— Sieboldi..... 115 Llewellyn Park, main entrance to.. 583 Lotus, Sacred, in a reclaimed swamp..... 499 Lumbering in Bear Meadows, Penn- sylvania..... 319</p>	<p>M</p> <p>Madroña of San Rafael, the great.. 151 Maple, a Sugar, in Ohio..... 380 Meeker House, Lyons Farms, New Jersey..... 391 Menispermum Dauricum..... 233 Miltonopsis Bleu splendens... 198, 199 Morning glory, a double..... 593</p> <p>N</p> <p>Narcissus cernuus pulcher..... 211 —— cyclamineus..... 209 —— incomparabilis..... 212 —— maximus..... 210 —— minimus..... 210 —— monophyllus..... 211 —— rupicola..... 213 —— triandrus..... 212</p> <p>O</p> <p>Oak, a branch of the Black..... 55 —— at Shandy Hall, Maryland... 259 —— Golden-leaved, on the Sierra Nevada..... 127 —— Live..... 486, 487 —— pruner, burrows of..... 557 —— larva, pupa and imago..... 557 —— Tan-bark..... 523 —— White..... 259, 450</p> <p>P</p> <p>Peach, a Chinese..... 438 Pelargonium, blighted leaves of... 353 Pepino in fruit..... 173 Phillips Estate, Beverly, Massachu- setts, plan of the..... 149 Picea Breweriana, branchlets of... 595 Pine-forest in Lower California... 187 Pines, Florida..... 80 Pinus clausa..... 161 —— Jeffreyi peninsularis..... 185 —— Monticola..... 5, 7 Populus trichocarpa, group of, in the Yosemite Valley..... 281 Prunus ilicifolia..... 475 —— tomentosa..... 581 Pterostyrax hispidum..... 389</p>	<p>Q</p> <p>Quercus alba..... 259, 450 —— chrysolepis..... 127 —— densiflora..... 523 —— tinctoria, a branch of..... 55 —— Virginiana..... 486, 487</p> <p>R</p> <p>Richea pandanifolia..... 365 Road through a Chestnut-wood... 571 Roaring Brook Road, Sheffield, Mass..... 617 Rock-garden at Kew..... 427 Rose, a new hybrid..... 461</p> <p>S</p> <p>Senecio macroglossus..... 295 Sequoia gigantea, felling a..... 546 —— stump of..... 547 Shad-bush, the western..... 415 Smilax glauca..... 425 —— Pseudo-China..... 53 Solanum muricatum..... 173 Spruce-forest on the coast of Maine 101 —— Weeping, branchlets of..... 595 Summer-houses, Colonial..... 65 Swamp, reclaimed, near Clifton, N. J..... 493 Symplocos crataegoides..... 89</p> <p>T</p> <p>Thorn, the White, in New England.. 221</p> <p>U</p> <p>Umbellularia Californica..... 355 Uromyces caryophyllinus on car- nations..... 18, 19</p> <p>V</p> <p>Virburnum cotinifolium..... 245</p> <p>W</p> <p>Washington's headquarters, Morris- town, N. J..... 307 Winter scene in New England..... 41</p>
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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLES:—White Pines. (With figures).....	1
Unsatisfactory Tree-planting.....	2
Crosses and Crossing of Plants.....Professor L. H. Bailey.	2
NEW OR LITTLE-KNOWN PLANTS:—New Orchids.....R. A. Rolfe.	4
FOREIGN CORRESPONDENCE:—London Letter.....W. Watson.	4
CULTURAL DEPARTMENT:—A Remodeled Plant-house. (With figure.)	
<i>J. N. Gerard.</i>	6
Cultivation of the Hellebores..... <i>M. Barker.</i>	8
Auriculas..... <i>E. O. Orpet.</i>	9
The Thrifts..... <i>J. Woodward Manning.</i>	9
The Whorl-flower, <i>Morina longifolia</i> <i>J. W. M.</i>	9
CORRESPONDENCE:—In the Shore Towns of Massachusetts.—V..... <i>J. B. Harrison.</i>	9
Rare Varieties of Apples..... <i>E. Williams, H. E. Van Deman.</i>	11
MEETINGS OF SOCIETIES:—American Forestry Association.....	11
NOTES.....	12
ILLUSTRATIONS:— <i>Pinus Monticola</i> on the Californian Sierras, Fig. 1.....	5
<i>Pinus Monticola</i> on the Californian Sierras, Fig. 2.....	7
Diagram of Plant-house, Fig. 3.....	8

White Pines.

OF the true White Pines, a natural group, so called probably from the color of the wood the different species yield, and always easily recognized by the arrangement of their leaves in clusters of fives, surrounded by loose deciduous sheaths and by their thin cone-scales, six of the eleven or twelve species inhabit the territory of the United States, where, indeed, so rich is the composition of our forests, are found fully one-half of all the different Pines now known to exist. The type of the White Pines is the tree universally known in all the eastern and northern states by that name. It is the most valuable timber-tree of the region it inhabits, and no other tree, perhaps, has ever played such an important part in the material development of a country. It has brought cities and railroads and great fleets into existence, and far and wide over this broad land has furnished employment to tens of thousands of laborers and supplied material with which countless homes have been built.

Europe possesses a single White Pine, a rather unimportant tree confined to the mountain regions of Albania and Macedonia, and botanically not unlike the White Pine of the Himalayas, *Pinus excelsa*, a noble tree, attaining sometimes the height of a hundred and fifty feet, and an important element in the coniferous forests of Butan and the upper valley of the Indus. The forests of Japan and the other islands of the north Pacific contain two or three White Pines, but these are small trees of no great economic importance, although the picturesque *Pinus parviflora* is one of the handsomest and most satisfactory of the smaller exotic Pines which can be grown in our northern gardens.

But the centre of distribution of the White Pines is western America, where they occur in half a dozen different forms from British Columbia to central Mexico. The greatest of them all, and the noblest of all the Pine race, *Pinus Lambertiana*, or, as it is popularly called, the Sugar Pine,

disputes with the Sequoias the honor of being the largest of American trees, and on the seaward slopes of the Sierras rises not infrequently to the prodigious height of three hundred feet, spreading far and wide its great branches, in autumn pendulous under the weight of its superb cones. The Sugar Pine, which does not range far above the northern borders of California, is a southern tree, and at the north is replaced by a species of less stately habit, but of tougher constitution and wider range. This is the White Pine of Montana and Idaho, where this tree, the *Pinus Monticola* of botanists, seems most at home, although it reaches the coast of British Columbia and ranges south along the Cascade and Sierra ranges to central California, where it reaches an elevation of 10,000 feet. At the north, in sheltered cañons and near the margins of streams, *Pinus Monticola* becomes a noble and stately tree, sending up a tall stout shaft five or six feet in diameter, and more than a hundred feet in height. In less-favored situations it grows less vigorously, and in California, on the summits of the wind-swept Sierras, it is low, gnarled and contorted, and never very abundant, but, like most alpine trees, grows in isolated situations, as shelter has made it possible for seedlings to struggle slowly to old age.

The appearance of the mountain White Pine as it grows at great elevations in California almost at the southern limits of its range, and the general appearance of the vegetation on the summits of the high mountains of California, are shown in the two illustrations which appear in this issue, pages 5 and 7. They are from photographs made by Dr. W. H. Rollins, of Boston, on the slopes above the Yosemite Valley, and we are indebted to his courtesy for permission to reproduce them.

In general appearance the western White Pine has a strong resemblance to its eastern relative, although the branches are stouter and are inclined to grow in an upright direction, giving the young trees a narrow pyramidal habit. The color of the foliage and the character of the bark of the two trees are very much alike, although the western species can always be distinguished from the eastern by its much larger cones, sometimes eight or nine inches long, and by its more rigid and less serrulate leaves. Of the conifers of western America none is more hardy or grows more satisfactorily in the eastern states, with the exception always of three or four species of Colorado, and of the western Pines it is the only one which up to this time has really succeeded in this part of the country, where several fair specimens large enough to produce their cones every year can now be seen—interesting objects to the student of trees, but hardly distinct enough from our own White Pine to fix the attention of the casual observer.

As a timber-tree in some parts of Montana and in the Cœur d'Alène and Bitter Root regions of Idaho *Pinus Monticola* is of great value, furnishing as it does the only high-grade soft lumber produced there, although, unfortunately, the rapidly growing population of the north-west is fast exterminating all the accessible and all the large trees, which are manufactured into lumber but little inferior to the best eastern white pine.

Of the other White Pines which inhabit the territory of the United States *Pinus flexilis* is scattered on high mountain-slopes from western Texas to northern Montana, and to Arizona, Utah, Nevada and south-eastern California. It is usually a small stunted alpine tree comparatively rare at the south but forming open forests on the eastern slopes of the Rocky Mountains of Montana, where it is low and round-topped and the prevailing tree; and on some of the mountain-ranges of central Nevada, growing tall and shapely and furnishing the best lumber of the region; although, perhaps, it would be more correct to say that twenty years ago it furnished the best lumber found in the Great Basin; for the mining camps and the railroads have already exterminated the Nevada Pine-forests as sources of lumber-supply.

On the high mountains of the north-west *Pinus flexilis* is replaced by another White Pine which much resembles it

except in the brilliant white bark which covers its old trunks, and in its shorter cones with thicker scales. This is the *Pinus albicaulis*, a low, stunted alpine tree of much picturesque beauty as it appears at the edge of the timberline on Mount Shasta in California, but too small, scattered and inaccessible to be of any economic value.

Pinus Ayacahuite, a noble timber-tree, and the common White Pine of northern Mexico, where it forms extensive forests on high mountain-slopes, in a small cone-form grows on a few of the ranges of southern Arizona. Related to this species, and often confounded with it, is a second Mexican Pine and the last of our list of American White Pines, *Pinus Bonapartei*, a tree of whose distribution and value very little is known.

A CORRESPONDENT writes us from a village where an energetic Improvement Society was established last spring: "I'm afraid our people are overdoing the matter of tree-planting. Every member seems to feel that it is incumbent upon him to plant a tree somewhere, and usually a good many. The work is not done with much care or system, and I feel half-inclined to protest; but so zealous are the workers that I would probably be set down as an outlaw if I objected. May I inquire whether you would ever consider it advisable to 'discourage the planting of trees?' No one should ever plant a tree unless he is able to give a good reason why it should stand in the place selected, and unless he can tell why the tree he has chosen is preferable to one of any other species for the spot. No tree of any kind should be planted anywhere unless it is a healthy, vigorous individual, and unless there is reasonable assurance that it will be properly cared for in after-years. Professor Beal has told us that of twelve memorial trees planted with some official ceremony in Ann Arbor, not one was found to have made satisfactory growth two years later; only one had received any cultivation—nearly all were having an unequal struggle with grass, insects and poorly prepared or thin and hungry soil. Tree-planting of this sort is worse than a waste of time. Such an example is bad in every way, discouraging, demoralizing.

It is not an uncommon complaint among the newly organized associations for village improvement that the zeal of its members finds an outlet in excessive tree-planting. It is an easy thing to put the roots of a tree in the ground, and then have it to look at with complacency as a monument of our public spirit. The watchful care which ought to follow, however, requires an unwavering determination, patience and study which do not always follow sudden spurts of devotion to some popular movement, and the trees languish. What is worse, the planters often look on themselves with great approbation for what they have done, and neglect to do anything else. One of the very best societies of this sort in New England passed through this experience, although the village now enjoys thorough sanitary drainage, clean, well-sprinkled and well-lighted streets, sidewalks kept in good repair, neat hitching-posts and public watering-trough, and a general trimness and tidiness which are the direct outcome of the work of this organization. All this necessary work was postponed, and the united energy of the reformers was devoted to planting trees, until so many had been set out that the removal of a considerable portion of them became one of the plainest necessities in the improvement of the village.

It is too often the case that those who have determined to plant trees begin by studying descriptions in nursery catalogues, and select a motley list of those which promise to show some striking departure from those with which they are familiar. They then wait until late planting-time and send their orders; and after the trees have come they begin to search about for a place to put them. If it happens that too many have been ordered, or that few of them are adapted to the position selected, they are hurried into the ground and huddled together, and in a few years they are objects of pity rather than of admiration.

Crosses and Crossing of Plants.

THIS was the subject of a paper read at the late meeting of the Massachusetts State Board of Agriculture by Professor L. H. Bailey, of Cornell University. The paper is too long to reproduce entire, but we give in a condensed form what seems to us the most instructive part of the argument. Professor Bailey's language is adhered to in the main, but in some cases a paragraph is summarized in a sentence, and in this way the original loses some of its richness of illustration.

Sex clearly has two offices: (1) To hand over, by some mysterious process, the complex organization of the parent to the offspring; and (2) to unite the essential characters or tendencies of two beings into one. The second office is the greater, for it insures an offspring somewhat unlike either parent, and therefore better fitted to seize upon any place or condition new to its kind. And as the generations increase, the tendency to variation in the offspring must be constantly greater, because the impressions of a greater number of ancestors are transmitted to it. If, therefore, the philosophy of sex is to promote variation by the union of different individuals, it must follow that greatest variation must come from parents considerably unlike each other in their minor characters. Thus it comes that in-breeding tends to weaken a type, and cross-breeding tends to strengthen it.

In this discussion the term "cross" is used to denote the offspring of any sexual union between plants, whether of different species or varieties, or even different flowers upon the same plant. There are different kinds of crosses. One of these is the hybrid, or a cross between two species, as a Plum and a Peach, or a Raspberry and a Blackberry. Crosses between varieties of one species are termed "half-breeds" or "cross-breeds," and those between different flowers upon the same plant are called "individual crosses." Distinct species, however, as a rule, refuse to cross. If we apply the pollen of a Hubbard Squash to the flower of the common field Pumpkin, the fruit will not form. The same is true of the Pear and the Apple, the Oat and the Wheat, and most very unlike species. Or the pollen may "take" and the seeds may grow, but the plants which they produce may be wholly barren, sometimes even refusing to produce either flowers or seeds, as in the instance of some hybrids between the Wild Goose Plum and the Peach. Sometimes the refusal to cross is due to some difference in the time of blooming, or some incompatibility in the structure of the flowers. But it is enough to know that there are characters in widely dissimilar plants which prevent intercrossing, and that these characters are just as positive as are size, color, productiveness and other characters. That is, the checks to crossing have been developed through the principle of universal variability and natural selection, just as other characters have been established. The result is simply that the best results of crossing are obtained when the cross is made between different individuals of the same variety, or, at farthest, between different individuals of the same species. In other words, hybrids—or crosses between species—are rarely useful, and it follows, as a logical result, that the more unlike the species the less useful will be the hybrids.

Again, crossing alone can accomplish little. The chief power in the progression of plants appears to be selection. Selection is the force which augments, develops and fixes types. Man must not only practice a judicious selection of parents from which the cross is to come, but he must constantly select the best from among the crosses, in order to maintain a high degree of usefulness and to make any advancement; and it sometimes happens that the selection is much more important to the cultivator than the crossing. I do not wish to discourage the crossing of plants, but I do desire to dispel the illusion which too often hangs about it.

CROSSING STRENGTHENS EXISTING TYPES.

The improvement of existing varieties by crossing is a more important office than the summary production of new varieties. This is the chief use which nature makes of crossing—to strengthen the type. Think, for instance, of the great rarity of hybrids or pronounced crosses in nature! No doubt all the authentic cases on record could be entered in one or two volumes, but a list of all the individual plants of the world could not be compressed into ten thousand volumes. There are a few genera, in which the species are not well defined or in which some character of inflorescence favors promiscuous crossing, in which hybrids are conspicuous; but even here the number of individual hybrids is very small in comparison

to the whole number of individuals. That is, the hybrids are rare, while the parents may be common.

Darwin was the first to show that crossing within the limits of the species or variety results in a constant revitalizing of the offspring, and that this is the particular ultimate function of the operation. Darwin's results are, concisely, these: self-fertilization tends to weaken the offspring; crossing between different plants of the same variety gives stronger and more productive offspring than arises from self-fertilization; crossing between stocks of the same variety grown in different places, or under different conditions, gives better offspring than crossing between different plants grown in the same place or under similar conditions; and his researches have also shown that, as a rule, flowers are so constructed as to favor cross-fertilization. In short, he found, as he expressed it, that "nature abhors perpetual self-fertilization." Darwin's well-known experiments show that crosses between fresh stock of the same variety were nearly thirty per cent. more vigorous than crosses between plants grown side by side for some time, and over forty-four per cent. more vigorous than plants from self-fertilized seeds. On the other hand, experiments showed that crosses between different flowers upon the same plant gave actually poorer results than offspring of self-fertilized flowers. It is evident, from all his experiments, that nature desires crosses between plants, and, if possible, between plants grown under somewhat different conditions.

In extended experiments of my own in the crossing of Pumpkins, Squashes and Gourds, carried on during several years, increase in productiveness due to crossing has been marked in many instances. Marked increase in productiveness has been obtained from Tomato crosses, even when no other results of crossing could be seen.

NEW CHARACTERS FITTED TO NEW CONDITIONS.

Almost every farmer and gardener at the present day feels that an occasional change of seed results in better crops. Much of the rapid improvement in fruits and vegetables in recent years is due to the practice of buying plants and seeds so largely of dealers, by means of which the stock is often changed. Even a slight change, as between farms or neighboring villages, sometimes produces more vigorous plants and often more fruitful ones. In the cross, a new combination of characters or a new power fits it to live better than its parents in the conditions under which they lived. In the case of change of stock we find just the reverse, which, however, amounts to the same thing, that the new characters or powers fit the plant to live better in conditions new to it than plants which have long lived in those conditions. In either case the good comes from the fitting together of new characters or powers and new environments.

Crossing within the variety and change of stock within ordinary bounds are therefore beneficial, and the results in the two cases seem to flow from essentially the same causes, and crossing and change of stock combined give much better results than either one alone. These processes are much more important than any mere groping after new varieties, not only because they are surer, but because they are universal and necessary means of maintaining and improving both wild and cultivated plants. Upon this point Darwin expressed himself as follows: "It is a common practice with horticulturists to obtain seeds from another place having a very different soil, so as to avoid raising plants for a long succession of generations under the same conditions; but with all the species which freely intercross by the aid of insects or the wind, it would be an incomparably better plan to obtain seeds of the required variety, which had been raised for some generations under as different conditions as possible, and sow them in alternate rows with seeds matured in the old garden. The two stocks would then intercross with a thorough blending of their whole organizations, and with no loss of purity to the variety; and this would yield far more favorable results than a mere change of seeds."

PRODUCING NEW PLANTS.

The second result of crossing, the summary production of new varieties, is the subject which is almost universally associated with crossing in the popular mind, and even among horticulturists themselves. It is the commonest notion that the desirable characters of given parents can be definitely combined in a pronounced cross or hybrid. There are two or three philosophical reasons which somewhat oppose this doctrine, and which we will do well to consider at the outset. In the first place, nature is opposed to hybrids, for species have been bred away from each other in the ability to cross. If, therefore, there is no advantage for nature to hybridize, we

may suppose that there would be none for man; and there would be no advantage for man did he not place the plant under conditions different from nature or desire a different set of characters. We can overcome the refusal to cross in many cases by bringing the plant under cultivation where new conditions overpower its former antipathies. Yet it is doubtful if such a plant will ever acquire a complete willingness to cross. In like manner we can overcome in a measure the comparative seedlessness of hybrids, but it is very doubtful if we can ever make such hybrids completely fruitful. It would appear, therefore, that with plants in which fruits or seeds are the parts sought, no good can be expected, as a rule, from hybridization, and this seems to be affirmed by facts. It is evident that species which have been bred away from each other in a given locality will have more opposed qualities than similar species which have arisen quite independently in places remote from each other. In the one case the species have struggled with each other until each one has attained to a degree of divergence which allows it to persist, while in the other case there has been no struggle between the species, but similar conditions have brought about similar results. These similar species which appear independently of each other in different places are called representative species. Islands remote from each other, but similarly situated with reference to climate, very often contain such species, and the same may be said of other regions much like each other. Now it follows that if representative species are less opposed than others, they are more likely to hybridize with good results; and this fact is well illustrated in the Kieffer and allied Pears, which are hybrids between representative species of Europe and Japan. We will also recall that the hybrid Grapes which have so far proved most valuable are those obtained by Rogers between the American *Vitis Labrusca* and the European Wine Grape, and that the attempts of Haskell and others to hybridize associated species of native Grapes have given, at best, only indifferent results.

HYBRIDS RARE AND UNSTABLE.

Another theoretical point borne out by practice is that because of the great differences between parents, pronounced hybrid offspring are unstable. Again, because of the unequal and unknown powers of the parents, we can never predict what characters will appear in the hybrids. This fact was well expressed by Lindley a half century ago in the phrase, "Hybridizing is a game of chance played between man and plants." The characters of hybrids as compared with the characters of simple crosses between stocks of the same variety are therefore ambiguous, negative and often prejudicial.

The difficulties in the way of successful results through hybridization are, therefore, the difficulty of effecting the cross, infertility, instability, variability, and often weakness and monstrosity of the hybrids, and the absolute impossibility of predicting results. The advantage to be derived from a successful hybridization is the securing in combination the most desirable features of both parents; and this advantage is often of so great moment that it is worth while to experiment in the face of numerous failures. From theoretical considerations it is apparent that hybridization is essentially an empirical subject, and the results are such as fall under the common denomination of chance. And as it does not rest upon any legitimate function in nature, we can understand that it will always be difficult to codify laws upon it.

Among the various characters of hybrid-offspring, the most prejudicial one is their instability; it is difficult to fix any particular form which we may secure in the first generation of hybrids; and, therefore, we find that the great majority of the best hybrids in cultivation are increased by bud-propagation, as cuttings, layers, suckers, buds or grafts. In fact, there are few instances of undoubted hybrids which are propagated with practical certainty by means of seeds.

This simply means that it is difficult to fix hybrids so that they will come "true to seed," and makes apparent the fact that if we desire hybrids we must expect to propagate them by means of buds.

Let us now recall how many undoubted hybrids there are, named and known, among our fruits and vegetables. In Grapes there are the most. There are Rogers' hybrids, like Agawam, Lindley, Wilder, Salem and Barry; and there is some reason for supposing that Delaware, Catawba and other varieties are of hybrid origin. And many hybrids have come to notice lately through the work of Munson and others. But it must be remembered that Grapes are naturally exceedingly variable, and the specific limits are not well known, and that hybridization among them lacks much of that definiteness which ordinarily attaches to the subject. In Pears there is the

Kieffer class. In Apples, Peaches, Plums, Cherries, Gooseberries, Blackberries, Dewberries, there are no commercial hybrids. The Strawberry is doubtful. Some of the Raspberries, like Caroline and Shaffer, appear to be hybrids between the red and black species. Hybrids have been produced between the Raspberry and Blackberry by two or three persons, but they possess no promise of economical results. Among all the list of garden vegetables—plants which are propagated by seed—I do not know of a single authentic hybrid, and the same is true of Wheat—unless the Carman Wheat-Rye varieties become prominent—Oats, the Grasses, and other farm crops. But among ornamental plants there are many; and it is a significant fact that the most numerous, most marked, and most successful hybrids occur in the plants most carefully cultivated and protected—those, in other words, which are farthest removed from all untoward circumstances and an independent position. This is nowhere so well illustrated as in the case of cultivated Orchids, in which hybridization has played no end of freaks, and in which, also, every individual plant is nursed and coddled. For such plants the struggle for existence is reduced to its lowest terms; for it must be borne in mind that even in the garden plants must fight severely for a chance to live, and even then only the very best can persist or are even allowed to try.

POPULAR MISCONCEPTIONS.

This list of hybrids is much more meagre than most catalogues and trade-lists would have us believe, but it is approximately near the truth. It is, of course, equivalent to saying that most of the so-called hybrid fruits and vegetables are myths. There is everywhere a misconception of what a hybrid is, and how it comes to exist; and yet, perhaps because of this indefinite knowledge, there is a wide-spread feeling that a hybrid is necessarily good, while the presumption is directly the opposite.

There is an old yet common notion that there is some peculiar influence exerted by each sex in the parentage of hybrids. It was held by certain early observers, of whom the great Linnaeus was one, that the female parent determines the constitution of the hybrid, while the male parent gives the external attributes, as form, size and color. The accumulated experience of nearly a century and a half appears to contradict this proposition. There are instances, to be sure, in which this old idea is affirmed, but there are others in which it is contradicted. The truth appears to be, that the parent of greater strength or virility makes the stronger impression upon the hybrids, whether it is the staminate or pistillate parent. And it appears to be equally true that it is usually impossible to determine beforehand which parent is the stronger. The common little pear-shaped gourd will impress itself more strongly upon crosses than any of the edible squashes and pumpkins with which it will effect a cross, whether it is used as male or female parents. Even the imposing and ubiquitous great field-pumpkin is overpowered by the little gourd. Seeds from a large and sleek pumpkin, which had been fertilized by gourd pollen, produced gourds and small hard-shelled globular fruits which were entirely inedible. A more interesting experiment with the handsome green-striped Bergen Fall Squash showed a similar prepotency of the gourd.

Uncertainty follows hybridization, and uncertainty also attaches to the mere act of pollination. Between some species, which are closely allied and have large and strong flowers, four-fifths of the attempts at cross-pollination may be successful, but such a large proportion of successes is not common. Even the most expert operators fail as often as they succeed in promiscuous pollinating. In my own experience 234 pollinations of Gourds, Pumpkins and Squashes, mostly between varieties of one species and including some individual pollinations, gave 117 failures and 117 successes. But from all the 117 fruits, for some of them turned out to be seedless, and some were destroyed by insects before they were ripe or were lost by accidental means, a few more than half of the successful pollinations—if by success we mean the formation and growth of fruit—really secured us seeds, or but one-fourth of the whole number of efforts, and this was considered a successful experiment. Referring to a record-book where experiments were made with many species, I find that a total of 312 efforts resulted in 89 successes, 223 failures.

And now the sum of it all is this: Encourage in every way crosses within the limits of the variety and in connection with change of stock, expecting increase in vigor and productiveness. Hybridize, if you are curious to know what nature will do about it, but do it carefully, honestly, thoroughly, and do not expect too much. Extend Darwin's famous proposition to read like this: Nature abhors both perpetual self-fertilization and hybridization.

New or Little-known Plants.

New Orchids.

ACAMPE MADAGASCARIENSIS, Kränzlin.—A small species introduced from Madagascar by Messrs. F. Sander & Co., of St. Albans. It is a Vanda-like plant, with thick leathery leaves, and a short capitate raceme of whitish flowers, with the lip of a faint rose-purple tinge. It appears to be distinct from *A. Renschiana*, Rehb. f., and is thus the second species of the genus from Madagascar.—*Gardeners' Chronicle*, November 21st, p. 608.

DENDROBIUM × *LEEANUM*, O'Brien.—A handsome species, introduced *Denrobium Phalaenopsis*, from New Guinea, by Messrs. F. Sander & Co., of St. Albans. It is allied to *D. superbiens*, Lindl., but differs in various particulars, notably in the larger, more open labellum, and narrower acute petals. The sepals are white at the base, freckled with rose above, while the petals are bright rosy crimson. The lip is green at the base, with radiating reddish lines, the front lobe and margins of the side lobes being of a rich rosy crimson. The pseudo-bulbs are three feet long. It was awarded a first-class certificate by the Royal Horticultural Society on November 10th last.—*Gardeners' Chronicle*, November 28th, pp. 640, 641 (t. 88).

CORYANTHES LEUCOCORYS, Rolfe.—A handsome large-flowered *Coryanthes*, introduced from Peru by Messrs. Linden, L'Horticulture Internationale, Parc Leopold, Brussels, with whom it flowered during June last. The bucket-shaped part of the lip is of a beautiful rose-color, and the helmet pure ivory-white, thus forming a very handsome contrast. The sepals are striped and suffused with light brownish purple on a pale yellowish green ground, and the petals marked with light purple on a white ground. It is very distinct from every other known species.—*Lindenia* (t. 293).

CYCNOCHE PERUVIANUM, Rolfe.—An interesting species from Peru, introduced by Messrs. Linden, L'Horticulture Internationale, Brussels, with whom it flowered during May last. The male flowers only are at present known, and these are closely allied to the corresponding sex of the Mexican *C. ventricosum*, though quite different in color. They are light green, with numerous small brown spots, and a white lip, and are borne in a long pendulous raceme.—*Lindenia* (t. 301).

Kew.

R. A. Rolfe.

Foreign Correspondence.

London Letter.

THE FRUIT MARKET.—We hear on all sides of a glut in the English market of almost all kinds of fruits. It is one of the peculiarities of this country that, while the market wholesale prices of fruit and vegetables may be so low that they scarcely pay the cost of carriage and packing, the consumer is compelled to pay the usual fancy prices. English garden-produce has to pass through too many hands before it reaches the mouth. I priced to-day in Covent Garden market American apples, Gravensteins and Baldwins and Ribstons; they were from twenty shillings to thirty shillings per barrel; grapes, fit to eat, were labeled four shillings per pound; pears, not absolutely rotten at the core, threepence each, and so on. Then I read in my morning papers of "a glut of apples in the market, the Canadian crop alone being estimated at a million barrels." But if I wish to purchase one of these barrels I must pay from twenty to thirty shillings for it. A few weeks ago I was informed by a market grower of grapes that he had houses full of good grapes, for which he would be glad to get anything over a shilling a pound, grapes, too, which I should have to pay four shillings for. Possibly you manage these things better in America than we do here. It is a mystery to me how growers for market get a respectable living out of their produce in this country. Yet a considerable number of them are unmistakably prosperous. The best market-grape in England is Gros Colman, of which there must be hundreds of tons grown in England alone.

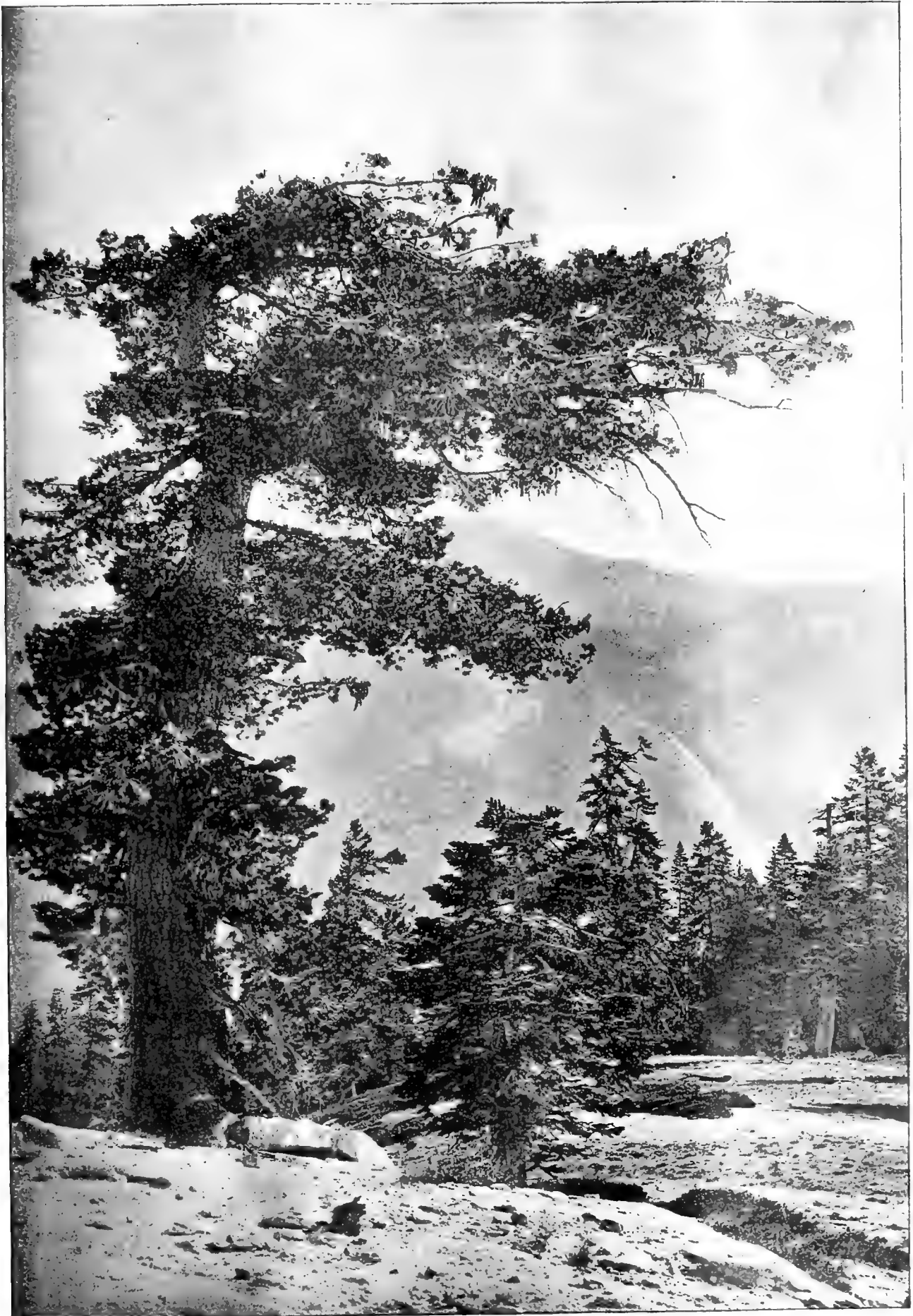


Fig. 1.—*Pinus Monticola* on the Californian Sierra.—See page 1.

It looks well, keeps well, and is very easy to grow, while as a cropper it has no equal. The favorite white grape here is Muscat of Alexandria, which is almost as good all round as Gros Colman. The king of apples here is Cox's Orange Pippin. It has a handsome skin, packed full of good meat; it keeps well and fetches a good price; at any rate I was asked threepence a piece for apples of this sort a few days ago.

LUCULIAS.—A tall shapely specimen of *L. gratissima*, bearing five or six dozen large heads of its handsome fragrant flowers, is now an attraction in a warm conservatory at Kew, while near by a smaller specimen of *L. Pinceana*, also in bloom, serves to show the difference between these two. *Luculia* is an old garden genus; at any rate, it has been in cultivation in England since 1823; and yet it is only rarely cultivated as a conservatory plant, notwithstanding its great beauty and delicious fragrance. Probably it finds much more general favor in American gardens than it does here. I have seen small plants of it grown in six-inch pots, the branches not more than eighteen inches long, and perhaps three or four of them each bearing large corymbs of flowers. A few years ago a large quantity of seeds of *L. gratissima* was received from India and was distributed liberally, yet the plant remains scarce here. Cuttings do not strike root easily, but a stock of plants may be raised from layers. If the branches of a flowering specimen are layered they are certain to flower the year following, if properly treated. In an ordinary greenhouse here this *Luculia* would not flower, although it grew freely, but on being removed into a warm, sunny greenhouse it has, after a year's growth, flowered most profusely. *L. gratissima* is a native of temperate Himalaya, from Bhotan to Nepal, where it forms a spreading Cinchona-like shrub, twelve to sixteen feet in height. The leaves are lanceolate, about six inches long; the corymbs are terminal, often six or eight inches through, crowded with long-tubed pale pink fleshy flowers, the lobes spreading out flat and forming a limb one and a half inches across. They expand in December and last a month or more. *L. Pinceana* differs from the above in having thicker, more closely nerved leaves, and a pair of tubercles at the base of each corolla-lobe. It is a native of the Khasia Mountains.

CATLEYA REX.—This plant was described in the *Gardeners' Chronicle* a year ago by Mr. J. O'Brien, who had seen it in the establishment of L'Horticulture Internationale at Brussels. A picture of the flowers was published in Part I. of *Lindenia* (English edition) last February, and the plant was described as having been "originally discovered by Monsieur J. Linden during his travels in South America, and again thirty years later by Wallis, who proclaimed it the most beautiful of Cattleyas." Living plants of it did not, however, reach Europe until last year, when it appeared in the collection of the above company, flowering in December. This species is said to be like *C. maxima* in the number of flowers produced on each raceme, and also in the length of the pseudo-bulbs. The flowers are as large as those of *C. aurea*, and are not unlike the white form of that species known as *C. Imschootiana*. Six flowers are represented on a raceme in the picture published in *Lindenia*, and I have been informed that old inflorescences show the scars of twice that number. Such a character ought to be sufficient to remove this plant from the *C. labiata* section of the genus although it was placed in that section by Mr. O'Brien. A few months ago several plants of *C. Rex* were disposed of in England by auction sale, and realized exceptionally high prices. Messrs. Linden now advertise an auction sale of 150 plants of this *Cattleya* in the rooms of Messrs. Prothero & Morris, on January the 8th next. The advertisement is sufficiently interesting to be quoted. It is as follows: "*Cattleya Rex*. The most famous Orchid ever introduced. Good imported plants, five, ten and twenty guineas each, according to size. The whole of the rest of the importation to be sold by auction on January 8th. Monsieur Ellner, our intrepid collector,

who has been searching for it for two years, writes that 'it is impossible to find any more.'"

CYMBIDIUM CYPERIFOLIUM.—I recently saw this in flower at St. Albans, and plants of it have this week been offered for sale at the auction rooms. It is not unlike *C. giganteum* or *C. Lowianum* in habit, but the leaves are shorter, narrower and more elegant, and the flower-bracts are larger. The scape is shorter than the leaves, semi-erect, bearing from four to seven flowers; sepals and petals linear lanceolate, acute, pale green and yellow, streaked with red-brown; lip narrow, pubescent within, white with red spots. The size of the flowers is almost that of *C. giganteum*. The plant is decidedly ornamental. It appears to thrive under the same treatment as answers for *C. Lowianum*. It is a native of the sub-tropical Himalayas. So far as I can ascertain, it had never been in cultivation until Messrs. Sander & Co. introduced it this year.

CYPERORCHIS MASTERSII.—A plant of this somewhat rare Orchid is now in flower in the cool house at Kew. It has erect, narrow bright green strap-shaped leaves, eighteen inches long, and almost horizontal scapes a foot long, decurved and bearing six flowers two inches long, white, with a few spots of red on the labellum and scented like Almonds. The general form of the flower is that of *Cymbidium eburneum*, but smaller. *C. Mastersii* was introduced many years ago from Assam. Lindley figured and described it in his *Botanical Register*, 1845 (t. 50), as a *Cymbidium*, a name by which it is still best known in gardens. It enjoys the same treatment as suits *Cymbidium eburneum*. A few weeks ago a second species of *Cyperorchis*—namely, *C. elegans*—was in flower in the same house at Kew. It differs from *C. Mastersii* in having a drooping, many-flowered raceme, and flowers of a pale straw color. Both this and the above remain in bloom a month or more. The only other known species of *Cyperorchis* is named *C. cochleare*. This has brownish green sepals and petals, and a yellow lip spotted with red. I have never seen living plants of it. It will be seen that the genus is made up of three species previously known as *Cymbidiums*. Sir Joseph Hooker states in his *Flora of British India* that, "except by the narrow lip, long hypochile, and small usually orbicular epichile (or midlobe), it is not easy to separate this genus from *Cymbidium* . . . and *Cyperorchis Mastersii* resembles very much *Cymbidium eburneum*."

CHRYSANTHEMUMS.—a correction. Through a slip of the pen I stated in the letter published on December 2d that five hundred new varieties of *Chrysanthemums* were submitted for certificates to the National *Chrysanthemum Society* at their exhibition held in November. The number ought to have been stated at fifty.

London.

W. Watson.

Cultural Department.

A Remodeled Plant-house.

SOME of my professional friends have been curious to know how I managed a greenhouse without any attention during the long day. From their point of view, with an eye to a sure crop, the inevitable changes of temperature seem fatal to success. Yet the thing is easily done, especially with a small house, and I do not find that moderate variations have any serious effect on the growth of my plants or their flowering. Of course, night temperature is important, and is more under control. By keeping the ventilators open, more or less according as the air outside is still or blustering, and by keeping a fair fire going, the plants have a plentiful supply of fresh air and are not chilled, even should there be a sudden drop of the thermometer. Some time since I described in *GARDEN AND FOREST* (vol. iv., pp. 55 and 67) the small, cheaply constructed house which has answered my moderate requirements, and has been a source of much pleasure at very little cost and care. At first there was trouble with the ventilation; the cold air from the top of the house stiffened the muscles of my back as I worked at the benches, and could scarcely have been good for the plants. However, I quickly turned the current of air by putting in a bellows-ventilator in the end of the house. This was done by making an opening two and a half feet long



Fig. 3.—Pinus Monticola on the Californian Sierras.—See page 4.

and a foot wide, to which a board was hinged. Cotton cloth was nailed to the edges of this and the greenhouse-wall, so that by opening out the board the air is conducted over the pipes and heated some before flowing into the house. A hood at the edge of the bench in front of the ventilator confines the air somewhat, and prevents it from passing out before lingering over the pipes. By opening the ventilator at the end sufficiently, downward draughts from the top of the house are entirely obviated.

Alongside of my house I have had a six-light cold frame, which has for a long time been a great care and annoyance. Cold frames are indispensable in a garden for storage, and are much used, of course, for growing plants. While I have used them for that purpose, it has always been under protest, for shifting sashes and covering and uncovering in all weather are labors not to my taste. There are some garden operations at which I draw the line. There is seldom a difficulty without a solution, and at last the six-light sash has gone, and I am enjoying the satisfaction of cultivating my half-hardy cold-frame plants in comfortable quarters. This was managed by a very simple re-arrangement, making what is practically a cold annex to my greenhouse. As this annex is proving a success, perhaps a few details may give useful hints to some fellow-amateur fond of hardy plants. The original house, it may be remembered, was a span roof eight feet wide, and with three-foot walls. The first operation was to set up four posts twenty inches outside of the wall, and on top of these a girder four inches by three was secured. Then the sashes on one side of the house were lifted and lapped on the girder, putting in new rafters, of course, to hold them. Outside of the old frame a new frame was made two feet wide of boards nailed together, with tarred paper between, and sunk in the earth nearly to the level of the surface. On top of these was spiked a two by three plate-piece, to which were fastened sashes one foot wide and three feet long. On top of these is another plate piece chamfered on one edge, to which was nailed a drip-board. Sashes are hinged on the girder, extending to this board. The ends were glazed, which completed the enclosure of the house. Inside entrance is gained through the furnace-room, and the path being sunk to the level of the furnace-pit, nearly two feet below the main house, there is six feet head-room over this. The space under the new sash is now a solid bed of earth six feet wide.

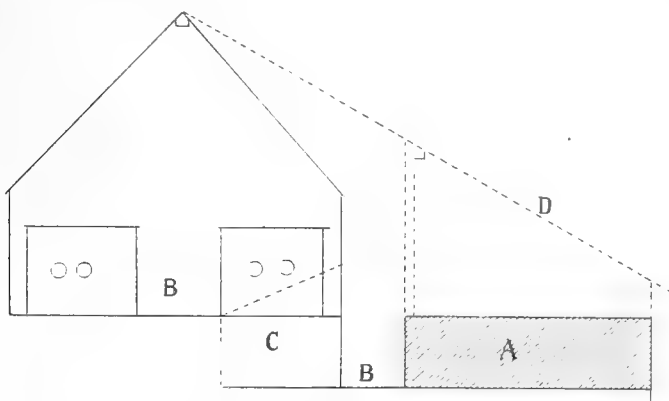


Fig. 3.—End-section of Plant-house, the addition in dotted lines.—See page 6.
A. Solid bed. B. Paths. C. Proposed fernery. D. Hinged sash.

In planning the changes my theory was that the warm air rising on both sides of the benches should keep the plants on them comfortable, and that in cold weather, when the ventilators are mostly closed, the cooling air would flow into the annex and temper it. The space above the wall was left open for this purpose, the opening being fourteen feet long and two feet wide. The arrangement has proved satisfactory, and there is usually a difference of fifteen to twenty degrees in night temperature between the two sections. The revised cold frame now appears as a solid bed, six feet by eighteen, at which one can work comfortably in any weather, and the temperature can be kept as low as may be desired. The sashes being hinged, by putting in partitions it is possible to make such variations of temperature as may be desired for different collections of plants. It will probably be several seasons before I shall work out the possibilities of my new acquisition, but this season I have flowered there a good crop of late Chrysanthemums, and have it now planted out with a few Roses, Carnations and Pansies, and a large collection of bulbs, Primulas and small hardy plants in pots. Azaleas and Genistas are seemingly destined to do well. It seems a capital place to bring on bulbs slowly.

There is one other change which I have postponed to another season. By dividing and removing half of the wall of the warm section, taking out the earth under the bench and putting in a stone wall at the edge of the inner path, there will be room for a temperate fernery two and a half by fifteen feet. Of course, it will be necessary to board this over to confine the heat to its present course. In this fernery there will be head-room of two feet at the rear and three feet at the front. There does not seem any reason why temperate Ferns and some other plants growing under the same conditions should not do well there. Of course, the wall will receive attention, and being laid up with earth will be planted with suitable Ferns, Lichens, etc. To resume, I have apparently improved my main house by getting more head-room and a less stuffy inclination of air, have gotten rid of a care in the cold frame, exchanging it for an equally suitable place for the plants—in some cases a more suitable one. My current work is scarcely increased, as the cool section dries out very slowly and seldom requires watering. The care of the stove, of course, is no greater. It will be seen that when the alterations are complete there will be in all two three-foot benches, a two-and-a-half-foot fernery, and a six-foot bed in a width of fifteen feet of greenhouse, which seems a fairly economical utilization of space. The tank sunk in the end of the path, I fear, will prove too cool to be of much service. As a measure of precaution, I have provided a covering which can be rolled over the lower sash should there occur very extremely cold weather, for, while the furnace has a capacity sufficient for both houses, I prefer the protection to the hard firing, which would possibly give too much warmth in the warm section.

Elizabeth, N. J.

J. N. Gerard.

Cultivation of the Hellebores.

THESE plants are easy to manage. They prefer a light rich soil, and a position comparatively dry and sunny in winter, and cool and shaded in summer. Shade at any season of the year is not an absolute necessity, full exposure to the sun being rather beneficial than otherwise, provided the roots can be kept moist and cool in hot weather by frequent and thorough watering. Most of the Hellebores grow naturally in soil of rather poor quality, but they make better foliage and flower more profusely under liberal garden treatment. A good method to pursue in planting is to excavate the soil to a depth of about two feet, replacing it with a mixture of fresh loam, leaf-mold and thoroughly decomposed farm-yard manure in equal parts, the best compost for all kinds of Hellebores, whether grown in the garden or in pots. The work should be done in early spring just as the new growth makes its appearance. It is unwise, however, to interfere with the plants when they are established and doing well. Sometimes they require fresh soil, or it is desirable to increase the stock, and then removal is necessary. A surface-dressing of rich manure will generally be found sufficient to keep old plantations in good condition if the soil about the roots is well drained, so that it does not become sour by stagnant water.

The manure should be applied soon after the flowering season, and allowed to remain on the soil all through the summer, and until a covering is again required in spring, when the exhausted remnants may be raked off. This mulch is very beneficial to the plants, apart from the nourishment they derive from it. The litter of the manure protects the roots against drought, and when no enrichment is needed a mulch of similar kind should be used. The lack of moisture at the roots is the great obstacle to overcome in cultivating these plants.

The flowers appear at a time when they are most valuable, on account of the dearth of other hardy flowers; but, unfortunately, their beauty is easily tarnished by the storms which then prevail. The only way to meet this difficulty is to arrange the plants compactly, so that a frame may be placed over them. Many object to such a contrivance as unsightly; but unless one has a cold greenhouse, in which the plants may be grown, the frame is the only cheap and handy way of securing perfect flowers and foliage in their proper season. And, after all, the flowers, lasting as they do from eight to ten days in water, are most enjoyable when cut in a perfectly clean condition and used for indoor decoration.

Much has been written about the inadaptability of Hellebores for forcing. They are not good subjects for this work. By exercising care, however, much satisfaction may be had from them. It is sometimes thought that they may be taken from the garden, potted and placed in heat immediately as successfully as some other hardy plants. Nothing can be farther from the truth. There are few cultivated plants to which artificial heat, applied without judgment, is so deadly.

The heat must be applied very gradually. The plants to be forced, moreover, should be grown in pots, plunged in the ground during the growing season, and not torn from the soil when they begin to show flower-buds. Grown outdoors in pots, they should be taken up early in autumn and again plunged in the earth of the frame or greenhouse where in time they are to have artificial warmth. The object of this second plunging is to maintain coolness and moisture about the roots until the flowers are developed. Plants under glass should always have an abundant supply of air, especially when under heat, and at no time should they be allowed to lack water. Not infrequently good forced specimens are killed completely by transferring them directly to the garden again. Hardening-off demands as much patience and judgment as inuring the plants to a high temperature, and without this the chance of retaining the stock for another year is very remote.

The species and varieties may be multiplied by dividing the roots in spring, when the plants are starting into growth. Select only strong portions for this purpose, and plant them in a rich soil. The pieces that have an unhealthy look always make sickly plants, when they grow at all. The plump, clean portions, no matter how small, grow vigorously and form good plants in a single season. Seeds can be used for propagation, but this is a tedious and uncertain proceeding. The seeds should be sown in a well-prepared cold frame, removing the plants to the open garden when large enough, which is generally from a year to eighteen months after sowing. The seedlings make slow progress at first, and they seldom flower before they are three years old. New varieties are not easily obtained in any other way, and it is the only resource of hybridizers; but, for all other purposes, propagation by division is by far the better method. It should be remembered, too, that a large proportion of the seedlings raised are quite unworthy of perpetuation as garden-plants.

Cambridge, Mass.

M. Barker.

Auriculas.

PRIMULA AURICULA is known as the Alpine Auricula to distinguish it from the fancy or exhibition kinds which have originated from the same source, but are the result of many years of careful cultivation and selection. Of the fancy Auriculas we have no need to speak here further than to say that they are not in commerce in this country, and probably never will be, as their constitution is much less vigorous than that of the parent *P. Auricula*, and, as a result of a generation or two of coddling, they are less hardy and much more liable to insect pests than the original stock. Fortunately for us the species has been preserved, and we still can cultivate it and enjoy its distinct beauty and fragrance. The best way to secure a stock of Auriculas is to get seed of a good strain, for there are marked differences in the quality of the flowers and the germinating power of the seed. The best time to sow the seed is the present month, for, as the seedlings are of rather slow growth in their earlier stages, it is much better to get them up to a good size before the heat of summer is upon us. Weak plants melt away under a hot sun, and the efforts of a whole season are lost.

If seed be sown now the plants will be large enough to pot off in March, and by May or June they can be planted out in a frame, where they can be shaded in the hottest part of the day, as heat is much more trying to them than cold. If the young plants have partial shade they will grow more or less all summer, and in fall will make rapid progress during the cool nights, and by the time winter sets in they should be thoroughly hardened off to withstand the cold. They will become hardened naturally, unless kept covered with sashes when there is no necessity for them, and when cold weather sets in a few dry leaves or Pine-needles may be spread among the plants, and shutters may be put over until spring, when the plants will start to grow, and flower as soon as the covering is removed. The plants are not hard to suit in the matter of soil. Loam, with leaf-mold and a little fertilizer, will be found satisfactory. Auriculas are fond of moisture, and during the growing season must have plenty of water, hence the difficulty of growing them in pots. When the foliage is large and thick the pots are covered and water difficult to apply, so we prefer to plant them out in frames, from which they may be lifted and potted in the flowering season, if wanted for indoor decoration, for which they are well adapted, as they last well and have exquisite color and a pleasing fragrance.

The only real difficulties in the culture of these Auriculas are the heat of summer, for which shade is an easy remedy, and the freezing and thawing of the winter season. If kept dry overhead frost does not injure them, but frost and wet

combined often rots them, hence the need of covering and a space for the circulation of air, when the plants will winter well and flower the spring after they are sown.

Those who have only the convenience of a cold frame will find great pleasure in cultivating Auriculas, as there are almost always some in flower where plants are grown in any quantity. Unfortunately, few attempt to grow them. I can sympathize with those who are discouraged, for some of the seed I used last spring proved disappointing. It is a great point gained if the seeds are authentic. We are told by dealers that Auricula-seed has a trick of waiting a year, or oftener two years, before it germinates, but I find that if the seed is good, all that has not given plants ready to prick off at the end of three months is not worth waiting for any longer.

South Lancaster, Mass.

E. O. Orpet.

The Thrifts.

AS a class of free-blooming perennials of neat habit the Thrifts, or Armerias, are possessed of much merit. All are tufted in growth, forming dense, hemispherical masses of evergreen foliage, while the flowers are borne in round heads on clean, long, wiry stems. Their season of blooming extends over most of the summer and early autumn, and in several of the varieties it is almost continuous throughout the growing season. Used in groups in mixed borders, in rockeries or as edging plants, they are clean, and give a variety of foliage and flower. Soil is a matter of small importance to them, provided it is not excessively wet.

A. vulgaris, the most common form, makes broad, slowly spreading tufts of dark green, linear foliage, and bears its purplish lilac flowers in loose heads on stems averaging six inches high. The variety *Alba* is very desirable, with lighter-colored foliage and pure white flowers in more compact heads. The variety *Lauchiana* is its best-colored form, with clear, deep crimson flowers, and is a very constant bloomer when seen in masses. Some time since Herr Max Leichtlin, of Baden Baden, sent out seed of *A. undulata*, and it has proved an acquisition, with unusually long, narrow, undulated foliage, and bears pure white flowers in nodding heads on bending stems ten to twelve inches long. It is an almost continuous bloomer with me and very hardy. *A. plantaginea*, with its broader foliage in dense rosettes, produces larger heads of pale rose or lilac flowers, often fading to white on stems often eighteen inches long. The variety *Formosa* is decidedly good, with showy, clear, deep pink flowers in large heads, and with us in a bed of fifty plants is never out of bloom from early June to killing frosts. Its long-stemmed habit and continuous blooming quality renders it especially valuable as a cut-flower. *A. cephalotes*, though the largest-flowered species, with us does not seem worthy of recommendation, owing to its objectionable habit of dying out the second or third year.

Reading, Mass.

J. Woodward Manning.

The Whorl-flower, *Morina longifolia*, has proved hardy with me in a variety of soils and exposures for the last three years. It is a plant of Indian origin, being a native of the Himalayas in Nepal at high elevations, and its flowers and foliage are striking. The leaves are narrow, about a foot long, deep, shining green in color, deeply cleft with wavy, margined lobes, thickly set with thistle-like spines, rendering careful handling a necessity. The flowers are tubular, with a broad, open mouth. In the bud and early stages of opening they are white, but soon change to rose and finally deep carmine in the throat, lightening in color to pale pink or white on the outside. They are borne in clusters or whorls at the base of the stiff, spiny upper leaves, together forming a leafy and floriferous long spike. The peculiar and unique change in color in flowers and the showy, thistle-like foliage, together with the glistening color of the latter, combine to render the plant fit for any collection and worthy of association among the best of hardy perennials. Until entirely proved for hardiness in moist or stiff soils, it would be well to give slight protection the first winter.

Norwood, Mass.

J. W. M.

Correspondence.

In the Shore Towns of Massachusetts.—V.

To the Editor of GARDEN AND FOREST:

Sir,—Orleans is a town of beautiful landscapes and attractive building-sites, and the summer people are beginning to appropriate them. A wise foresight would provide a large area here for out-of-door rest and recreation, a pleasant reach of shore-land, where thousands of inland people might bathe

and walk by the sea, but there is no park or common or public beach. The time is coming, as in other shore regions, when there will be throngs of people all summer long—the autumn is the best of the year on the Cape—and when there will not be much more space or freedom for them than convicts enjoy in the state prison, marching in lock-step to dinner and away from it again. The summer dwellers here will have their rooms in the cottages and in great hotels and boarding-houses, and they will have the freedom of the sidewalk and the public road. There will be no rambling over breezy uplands, or musing where the rolling surf beats and thunders on the shore. The uplands will be an almost continuous village, and the shore everywhere will be in somebody's backyard. Those who wish to see the Cape country before its wildness and freedom are displaced by the new stage of civilization, with its warnings "Private grounds" and "Keep off the grass," forbidding visitors to leave the highways, should visit it within the next few years.

Orleans can advertise one attraction which I suppose not many towns can rival. The alms-house is not needed for its original purpose, for long and long it has had no pauper tenants, and has been constantly let for a dwelling. Think of living in a town where even the poor-house brings in an annual revenue! Who says the Cape is a barren region and poor? There are many inland ponds or lakes here, some salt, many fresh. If they had been made expressly for purposes of pleasure and recreation they could not have been better. The Orleans Cemetery Association owns the new part of the cemetery. It is on a hill, with a fine view of the ocean and bay, and the summer people go there in numbers. The old part is not so high. The title to it is probably in the town. There are three wind-mills in Orleans, each about 150 years old. A man from the city with a new place here thought he would buy one of these mills and set it up in his grounds as an article of "bigotry and virtue," but the owner of the mill asked \$300 for it. The summer resident concluded that he would try to get along without a wind-mill, and the "boom" in these antiquities came suddenly to an end. The town clerk bought one-fourth of the one at Orleans village for \$25, and it pays for itself by its tolls every year. These mills are about thirty or thirty-five feet high, and twenty feet in diameter at the base, which is square or octagonal. They are not picturesque objects, though it is the fashion to say they are. They are too small, and all their lines too severely simple to be impressive, and they are interesting only because they are unfamiliar to most visitors. There is a valuable public library here, and the town owns a very small area around the library building. The town-hall lot should be considerably extended while land is cheap. It is far too small for permanent public convenience. Hon. John Kenrick, A. T. Newcomb, David L. Young and George S. Nickerson are much interested in the objects of the Trustees of Public Reservations, and will aid them in any convenient way. There was a meeting here early in December to consider the need of open spaces for public resort. After experimenting with the topic at meetings in Boston and at Provincetown I found here that an average country audience responds readily to a direct presentation of the essential facts and obvious deductions related to this matter. It is always interesting to try the effect of a new subject on audiences of different kinds.

Eastham has no considerable public holdings. The early history of the town is interesting, but it receives little popular attention. I noted that in 1705 the town voted to fine any freeman living within seven miles of the polls if he failed to attend an election. Some interesting experiments in Asparagus-culture made here during the last few years give promise of a new and highly profitable industry for farmers and market-gardeners, and Turnips grown in this region are said to distance all competition. Under existing local conditions such facts are of great interest and importance. Wellfleet is an attractive town. All its interests are at present much depressed by the decay of the old industries of its people—fishing, whaling and boat-building. Much land has been bought here by non-residents within a few years, but not much of it has been occupied or improved. The town formerly owned Great Island and Beach Hill, but sold these holdings a few years ago to Mrs. France B. Hiller, of Wilmington, Massachusetts, who also bought much land of private owners in the town. I believe she is to expend a specified sum within a certain term of years in improving the lands bought from the town, otherwise the title will revert, and the property become again a public possession. No improvement has yet been made. People in the town say that many persons made claims for compensation for their rights in one of the private estates bought by Mrs. Hiller, and that "she bought them out, a thousand of them, for a dol-

lar apiece. Whoever wanted a dollar said he was one of the heirs, and she paid him a dollar, and he signed away his right, whatever it was." Perhaps this is the beginning of the growth of a legend. The town long ago planted a considerable tract on Great Island with Pines, and they have grown well. It owns a small piece of woodland—no one knows its area—which supplies all the fuel needed for the schools of the town, and will do so for many years to come, though the timber does not grow as fast as it is cut. It is but a few acres in extent, and is said to have belonged to the last survivors of an Indian tribe, and to have reverted to the town at their death. Wellfleet recently bought a playground near the High School building at a cost of \$150. The area is 280 by 286 feet. There is an old cemetery on Taylor's Hill, owned by the town. Its dimensions are 171 by 144, 149 and 167 feet. Beach grass, no trees. The hill is seventy or eighty feet high. No interments for many years. A land company is operating at South Wellfleet, and has sold hundreds of lots. Wellfleet had once 160 sail of sea-going vessels, now not over twenty. The valuation of property for taxation is declining. A profitable beginning at garden-farming has been made here and in the next town, Truro, and there is room for a great extension of this industry in both towns. There are some historic places in Truro which should be marked, and the early history of the town is worthy of far more attention than it receives from the present inhabitants. Popular interest in the local history will probably have a new development, as Mr. Shebna Rich, of Salem, has written an interesting and valuable history of Truro. Several small tracts of land have reverted to the town by non-payment of taxes. None of them is suitable for a reservation for public resort. All visitors here go to Highland Light. I refer my readers to the accurate and entrancing description of the excursion in Mr. Frank Bolles' new book, "The Land of the Lingerer Snow." All this shore should be forever accessible to the public. (My report on Provincetown was published in GARDEN AND FOREST for October 21st.)

I have just reread Thoreau's book on Cape Cod. It is interesting but one-sided, as it was meant to be. The author walked along the shore, keeping to the very edge of the water nearly all the way down the Cape. He did not see the country inland, and appears to have had an entirely erroneous idea of it. He says himself, "Our story is true as far as it goes. We did not care to see those features of the Cape in which it is inferior or merely equal to the mainland, but only those in which it is peculiar or superior. We cannot say how its towns look in front to one who goes to meet them; we went to see the ocean behind them. They were merely the raft on which we stood, and we took notice of the barnacles which adhered to it, and some carvings upon it." The Cape region is much better wooded, has better soil, and is far more interesting and attractive than his account of what he saw along the beach has led people to believe. His book is usually read as if it were an adequate description of the Cape country; but all his readers should make large allowance for Thoreau's love of paradox, even when he has seen what he describes. I suppose that what he says of the few people whom he saw during this excursion is strictly true, but it does not apply to the Cape people in general any more than to the people of the author's own town of Concord; or, to give a better idea of it, it is exactly of a piece with his description of Boston: "I see a great many barrels and fig-drums, piles of wood for umbrella-sticks, blocks of granite and ice, great heaps of goods, and the means of packing and conveying them, much wrapping-paper and twine, many crates and hogsheads and trucks, and that is Boston. The more barrels, the more Boston. The museums and scientific societies and libraries are accidental. They gather around the sands to save carting. The wharf-rats and custom-house officers and broken-down poets, seeking a fortune amid the barrels, their better or worse lyceums and preachings and doctorings, these, too, are accidental."

The wonderful "Cape Country," with its indefinable charm, seems to me the most interesting region in New England, or anywhere. There ought to be a new book about it. It has no such place in our literature as it deserves. As I walked through it, the extraordinary purity of the air made me feel that I should like to be a gypsy and camp out in all the towns. After we pass Chatham, going down the Cape, the atmosphere is the same as if we were on a small island far out at sea. Every possible breeze is a sea-breeze, no matter from what quarter it blows. I once camped out for a while in the snow on the mountains in the Crater Lake region, in sight of Mount Shasta, and that is the only time I have ever tasted elsewhere an atmosphere so vivifying as that of the Cape Cod country. The number of ponds and lakes on the Cape is much greater than most people know, and the inland scenery is serene and

restful, but not dull or tame. For people who want sea-air our country has no better region, and in a few years it will be thronged and crowded by summer dwellers, from Provincetown to the shores of Buzzard's Bay. It will be a paradise for women and children while the wildness and freedom remain unspoiled. Unless great areas here are made public holdings, free for the people's enjoyment forever, the time will come when the tired dwellers in the cities, and in the vast interior of our country, who are driven by the heat of summer to seek rest and new life by the sea, will find here the city over again, and be "cribbed, cabined and confined" in conditions very like those from which they are trying to escape. That would be a sad sight for thoughtful men.

Franklin Falls, N. H.

J. B. Harrison.

Rare Varieties of Apples.

To the Editor of GARDEN AND FOREST :

Sir,—In regard to the difficulties attending the attempt of N. D. to obtain other than the ordinary varieties of Apples, I would say that nurserymen must be largely governed by the law of supply and demand, and nursery stock, unlike many other articles of trade, soon deteriorates in quality and salability by keeping. Planters of orchards for commercial purposes, whose sole object is profit, confine their planting to few varieties, and those well-tested sorts that promise to serve their purpose. Novices and experimenters, who seek only their family supply, indulge in a larger range of varieties, but they naturally find that the leading sorts receive most attention from nurserymen. It requires a good deal of boom to dispose of much stock of any new thing, and generally at a much higher price on account of this increased expense. The very limited call for some old and once valuable sorts makes it unprofitable to grow them, and even a few trees would exceed the demand till they outgrew a salable size. I am a little surprised, however, that Cogswell and Baily Sweet, and even the Winesap, proved hard to find. These are all old and good kinds, and ought to be on sale in limited quantities in some of the eastern nurseries. Stephen Hoyt's Sons, of New Canaan, Connecticut, ought to have them, especially the first, as it is a Connecticut fruit. Arkansas Black is a western Apple, and probably has not made any reputation east as yet. Stark Brothers, of Louisiana, Missouri, propagate it largely. Winesap could doubtless be had of them in any quantity desired. William J. Heikes, of Huntsville, Alabama, could also probably supply them. These firms make more of a specialty of new fruits than some of our eastern growers. Princess Louise is a new Apple of Canadian origin, and probably has not yet acquired American citizenship. L. Wolverton, of Grimsby, Ontario, could probably furnish your correspondent with trees or cions.

The only mention of Palouse I have seen was in the *Rural New Yorker*, where this Apple is said to have originated in Washington from Illinois seed, and it is doubtless too young yet to have attracted much notice east.

My advice to N. D., if he fails to secure what he wants after reasonable effort, would be to take good thrifty trees, irrespective of variety, preferably of one kind if straight and of vigorous growth, so as to make a uniform foundation for my orchard. After setting them I would secure grafts of the varieties I wanted from those who have fruiting trees. Get a few grafts and bud or graft the young trees with them. There are in many sections of our country excellent old varieties that are well worth growing in localities suited to them that can be had in no other way, as they are not known and recognized in general pomological society. Many such will be lost unless some appreciative friend saves them in this way. The process is simple and the expense is light. The mail could deliver a few cions of Palouse from Washington at one-tenth the cost of a tree, probably one-fiftieth, and with more safety.

Montclair, N. J.

E. Williams.

To the Editor of GARDEN AND FOREST :

Sir,—In reply to the inquiries of your correspondent, N. D., in a recent issue, let me say that the Arkansas Black Apple can be procured from Mr. W. G. Vincenheller, Springdale, Arkansas. Many of the other western nurserymen are propagating it. I think all of the other Apples mentioned by your correspondent can be procured from nearly any of the large western nurseries except Princess Louise and Palouse. The latter I have carefully tested, as far as the fruit is concerned, and find it to be a very good apple. It is medium of size and beautifully colored, red striped and yellow. The quality is very good, and I think it will keep quite well through the winter.

Department of Agriculture, Washington.

H. E. Van Deman.

Meetings of Societies.

American Forestry Association.

THE tenth annual meeting of this society, held in Washington last week, was more interesting and encouraging than any which has preceded it.

On the forenoon of the first day of the meeting the report of the Executive Committee was read, showing that the special effort of the year has been to secure Reservations of public timber-lands under the Act of Congress of March last, which authorizes the President, "by public proclamation, to declare the establishment of such reservations and the limits thereof." Encouraged by this law, the Association has gathered and laid before the President facts and arguments to induce him to make certain reservations. The recommendations have been favorably received by the President, the Secretary of the Interior and the Commissioner of the General Land Office. Surveyors from the Land Office have been sent to examine the tracts. Several reservations have been made already, while others are under examination.

A meeting for discussing this subject was held on Tuesday afternoon, when the Executive Committee presented the following declarations :

"1. Reservations in detached localities, while perhaps preferable to none, will not satisfy the needs of forest-protection unless their number is sufficiently large to embrace practically all the remaining public woodlands.

"2. The all-important problem is that of the management of these reservations, made or to be made, which should be solved at once and simultaneously with the making of the reservations.

"3. The principles upon which such management must proceed are laid down in a draft of suggestions for a bill, in which are provided safeguards to protect prior rights ; return of agricultural lands to entry ; licenses to prospect for minerals, to camp, fish, hunt and otherwise use the reservations legitimately ; licenses to cut timber under regulations adapted to the necessities of the locality ; protection against fire and theft, and such organization as will secure, with the co-operation of state authorities, the objects of the reservations, and at the same time offer as little friction as possible to existing conditions."

Secretary Noble was present, and declared himself heartily in sympathy with the aims and purposes of the Association. He invited the Association to present to him its recommendations, and promised to do all in his power to further its desires.

The Commissioner of the Land Office was prevented from attending by sickness in his family, but a paper from him was read by Mr. Jecko, an agent of the office, expressive of his sympathy with the purposes of the Association. Senator Dawes, in speaking of the inroads made on the forests by invaders, said that the ingenuity of the law-maker has not yet equaled that of the spoliator. He believed the sentiment of Congress and the country was to preserve the forests and protect them from the invasions of the unscrupulous on all hands. An effort should be made, he thought, to convince Congress of the need of action, and in that body he thought there was an excellent field for missionary work. The active interest manifested by the President, the Secretary of the Interior and the Commissioner of the Land Office was regarded by the Association as a most encouraging fact.

The following is a portion of the memorial presented to the President :

That these reservations are for the good of all is not yet understood by large numbers of worthy but uninformed citizens. This is apparent from the protests made against these reservations. The basis of such protests is that these large areas are to be permanently withdrawn from the use and enjoyment of the people. Such is not our purpose, but the very opposite. The object of such reservations is to increase the sum total of the productiveness of our territory, making each acre do its utmost for the benefit of our people. The lands within these reservations are not fit for agriculture, but are capable under wise management of producing a greatly increased amount of forest-products annually. While it is our wish to permanently reserve the land, it is equally our wish that its products may year by year, under a competent forest-administration, be used by the people under equal and just laws. Especially do we wish to minimize the destruction of forest-areas by fires and the wasteful and erroneous methods of forest-use now prevalent.

If it is once understood that by these reservations neither the bona fide settlement of agricultural lands nor the right of prospecting for and opening of mines is to be interfered with,

and that the demands for wood material are to be satisfied in a legal, equitable and simple manner, while at the same time keeping up supplies by protecting them from fire and waste and by securing their reproduction, it is believed that all bona fide opposition will cease, and the boon, which such reserves promise, will be welcomed by all persons interested in the steady and prosperous development of the western states.

After naming and describing several tracts for reservation, the memorial concludes:

At the same time this Association does not believe that the best results in forest-preservation and management can be attained by partial reservations, but after mature deliberation desires to again record its firm belief that only by the withdrawal of all public timber-land unfit for agriculture, and a complete and independent bureau for its management, can the question of forest-preservation be solved.

The principal papers read were by B. E. Fernow, Chief of the Forestry Division; J. D. W. French, of Massachusetts; Gifford Pinchot, of New York, and President Adams, of Cornell University. We hope to publish extracts from them in future issues. The officers elected for the year were: President, William Alvord, San Francisco, California; Treasurer, H. M. Fisher, M.D., Philadelphia; Recording Secretary, N. H. Egleston, Washington, D. C.; Corresponding Secretary, Edward A. Bowers, Washington, D. C.

Notes.

Mr. R. J. Hinton's *Progress Report on Irrigation in the United States* says that irrigation was practiced by the Indians in Mexico and Arizona at least five centuries ago, and that among ourselves it seems to have been first practiced by the Mormons in their Great Salt Lake settlement.

A correspondent of the *American Florist* commends the new pink Carnation, Grace Battles, as superior even to Grace Wilder, and predicts for it a greater popularity. The flower is said to be larger and a trifle lighter in color. It is borne on a stout stem, and does not burst its calyx. The new plant is one of Mr. Edwin Lonsdale's seedlings.

On very cold nights window-plants are best protected by the homely plan of hanging one or two newspapers between them and the glass. The air between the layers of paper is an admirable non-conductor, and when high winds accompany a low temperature this simple device will often make a difference of ten degrees at the point where the plants stand.

In regard to the danger of sterilizing the soil by applications of the Bordeaux mixture, Professor Halsted writes that he has seedling plants and cuttings growing in soil which contains one per cent. of copper sulphate, and they are as vigorous as similar plants in soil entirely free from copper. It would require a century of spraying on the approved methods before the soil of a vineyard or orchard would contain a like proportion of copper.

A dispatch to *The Tribune* announces that the state fruit-inspectors of California, last week, seized diseased fruit-trees from the east valued at \$5,000. Among these were Peach-trees, with yellows and curculio, and Plums, Prunes and Apricots, also diseased and infested with insects. Eastern nurserymen made vigorous protests, but the inspectors paid no attention to them. The nurserymen do not assert that the trees are free from pests, but they declare that the diseases will not develop in California, a statement which fruit-growers there consider an error.

A prune-grower in Santa Clara County, California, one Gordon, has just refused an offer, it is said, of \$30,000 from a Bordeaux firm that wished to buy his fruit and sell it as the French product. The price offered for the prunes was satisfactory, but the stipulation was made that the prunes should be shipped in sacks. The only inference from this was that the Bordeaux firm would pack them as French prunes. Mr. Gordon would not consent to this, as he believes, if California growers use the same care and skill in packing that the French do, they will soon contest the prune industry with them.

At this season in extensive shrubberies, like many of those in Central Park, beautiful effects are produced by the haze of soft color which hangs over them. This comes from a fusion of the various tints of the bark on the branches. The most casual observers are familiar with the ashen gray of some of the Thorns, the crimson of the Dogwoods and the yellow of

the Willows. But each species and variety of shrub and tree has a color of its own, and as these combine on a bright day every mass of branchlets, at a little distance, is enveloped by a luminous mist, which adds much to the charm of a winter-landscape.

"There is very little forest left in this state," recently said the *Pittsburgh Dispatch*, "which is worth anything for lumber, and meantime the railways are consuming all the hard-wood large enough to make a tie, so that there is no prospect of a renewal of our hard-wood timber in a century, and the Pine and other persistents do not readily reclothe the wastes. But worse than the loss of timber, for which substitutes may be found, is the fact that since the denudation of the forests our climate has become so uncertain that, even with the aid of the Signal Service, no business calculations can be based on the weather, and birds and animals have not yet acquired new instinct such as will enable them to serve us as barometers. Even the hoot-owl misses it as often as the Weather Bureau.

In an address before the Wisconsin State Horticultural Society on plants as affected by cold, Professor Goff stated that whatever we can do in the way of treatment of the soil or of the plant that will induce early maturing of their growth, will tend directly to increase their hardiness. A well-drained soil that warms promptly in spring and retains its warmth late in autumn, and is at all times free from excessive water, is one of the essential requisites to well-matured wood in plants that incline to late growth. Nitrogenous manures tend to stimulate growth, and hence should be avoided, as should cultivation late in summer, since by increasing soil-moisture it tends to a succulent condition of the wood. The growing of some crop that has a large leaf-surface, as Buckwheat, late in the season is of advantage, since it tends to reduce the water-content of the soil, and thus to hasten maturity. Pinching the tips of the growing shoots at the beginning of autumn acts as a check to growth, and thus tends to ripening of the wood. Removing the leaves from young trees that incline to grow too late promotes the same end, and in late varieties of the Apple it is found that a prompt gathering of the fruit has a tendency to promote wood-maturity.

At the meeting of the Peninsula Horticultural Society at Easton, Maryland, the Committee on Small Fruits say in their report that old beds are not the ones that pay the grower, and future years will find them fruiting their Strawberry-beds but once, Raspberries not over four times, and Blackberries not more than seven or eight years. It has been shown that fall or winter plowing is the best for the Strawberry-beds for spring planting, and the old theory that they should never follow a clover-sod has been so completely exploded that we now know that there is no other preparation so good as to turn a young clover-sod one or two years old at the most, and this is equally true for all the berry crops. It has even been found that the mulch for Strawberry-beds may be grown right on the patch, and if the ground is strong and the weeds have been thoroughly kept under, no harm appears to result from ceasing all work on the beds about August 1. The growth of Fall-grass, Crab-grass, etc., which will follow, is all killed by the first heavy frost and, left on the ground, makes an excellent mulch for the berries. Experiments are now going on that promise to harness the Scarlet Clover to the work of improving our berry-patches, as has been done with larger fruits. This may be sown after the fruiting season on Raspberry and Blackberry fields, and a good crop of green manure will be ready to turn under in April, this furnishing nitrogen to the soil and improving its mechanical condition at the same time. It has been shown that potted Strawberry-plants set in August will give a crop of the best fruit the following season, and we believe that as good results may be obtained from layer-plants set out about the time of our early August rains, thus making it possible to grow a good crop of the best berries at a greatly reduced cost for cultivation, and to have a crop of Clover growing during April and May decaying through June and July in the soil that is to grow our Strawberries the following spring.

Catalogues Received.

FERRIS NURSERIES, Hampton, Franklin Co., Iowa; Small Fruits, Fruit and Forest Trees.—FRED. W. KELSEY, 145 Broadway, New York; Choice Hardy Trees, Shrubs, Roses, etc.—F. B. MILLS, Rose Hill, Onondaga Co., N. Y.; Flower and Vegetable Seeds.—ORLANDO NURSERIES, Orlando, Fla.; Sub-tropical Fruit Trees and Ornamental Plants.—PITCHER & MANDA, United States Nurseries, Short Hills, N. J.; Orchids and Cyripediums.—RUSSELL BROS., Highlands, Macon Co., N. C.; Native Ornamental Trees, Shrubs and Plants.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLES:—Ready-made Plans for Planting.....	13
The Operations of the Boston Board of Survey.....	14
Notes of a Summer Journey in Europe.—IV.....	14
An Evergreen Shrubbery.....	15
Winter Rambles in the Pine-barrens.....	16
NEW OR LITTLE-KNOWN PLANTS:—Chrysanthemum, Walter Hunnewell. (With figure).....	16
CULTURAL DEPARTMENT:—Iron-clad Roots.....	16
Anthraxnose in Bean-seeds.....	18
The Carnation Rust. (With figures.).....	18
Fuchsia, Dunrobin Bedder.....	19
Hybrid Violas, <i>Primula floribunda</i>	19
<i>Galanthus nivalis</i> , var. <i>Octobrensis</i>	19
THE FOREST:—Management of the National Forest-reservations.....	20
CORRESPONDENCE:—Do Varieties Run Out?.....	21
Winter Vegetation on Florida Sand-dunes.....	21
RECENT PUBLICATIONS.....	22
NOTES.....	24
ILLUSTRATIONS:—Chrysanthemum, Waller Hunnewell, Fig. 4.....	17
<i>Uromyces caryophyllinus</i> ; pustules on the stem and leaves of a Carnation, Fig. 5.....	18
<i>Uromyces caryophyllinus</i> ; cross-section of pustule, Fig. 6.....	19

Ready-made Plans for Planting.

NOT long ago we received the following inquiry: "I have a small lot containing about three-fourths of an acre of land on which I propose to build a modest house. The shape of the plot is nearly rectangular, and it is twice as long as it is broad. Can you refer me to any prepared plan for laying out such a piece of ground which would probably be suitable for my purpose?" It is not to be assumed from this that our correspondent imagines that ready-made plans, in assorted sizes, are kept in stock, and that these can be made to fit any lot of a given size or shape like a ready-made garment, and yet it is plain that he does not clearly understand what kind of problems are to be met and solved in every case where a dwelling-house and its surroundings are successfully adjusted and arranged. We do not know whether this land is in a town or in the open country; whether it is level or on a hill-side. It may be desirable to have a portion of it serve simply as the foreground to some pleasing landscape. Perhaps the planting should be arranged to frame in some distant prospect or to shut out from view some disagreeable object, and we do not even know how the land lies in relation to the points of the compass, not to speak of the direction and position of any outside objects, attractive or repulsive, which must be considered in the design. We know nothing of the size or the character of the house, and nothing of the taste or needs of the family who propose to occupy it, and without knowledge of these and a hundred other essential considerations it is not possible to give advice which will be of real value in any particular case.

We are aware that planting-plans are sometimes furnished by persons who have nothing to guide them but an outline map of the ground. We have known architects to furnish plans for a building before they had ever seen the land on which it was to stand. In a recent instance the plans for a villa of some pretensions were prepared under the impression that the main entrance faced the east, when in reality it looked toward the south-west,

so that every provision which had been made with reference to sunshine and shadow was hopelessly wrong. Few architects, however, would attempt any serious work with so little knowledge of the lay of the land on which it was intended to build; and just here it may again be insisted on that the plan of the grounds should depend largely on the plan of the house, and, for reasons which have often been urged in these columns, the two should be designed together, or, rather, should form one consistent scheme. This means that the approaches, entrances and the various outlooks from the house should feel the influence of their surroundings, which should not only determine where the house should be placed, but how its internal structure should be arranged. It is plain, too, that the planting must, in a large measure, be controlled by the style of the house. Even a detail, like the planting about the house-foundation, should be modified as the building is low or lofty, modest or stately. A varied collection of vines or shrubs of distinct or diverse forms, that would be appropriate along the base-wall of an irregular building, would be out of place along the straight lines of a plainer structure. Convenience and comfort, as well as good taste, demand a perfect correlation between the house and its surroundings.

It is not to be inferred from this that the volumes of plans which have been published are all useless. A complete plan may be most instructive if accompanied by a full explanation of the reasons which guided the artist in each step of his design, and any plan is valuable so far as it can be made to illustrate sound principles. It is true that many published designs are misleading rather than instructive, because the laws they aim to enforce are vicious, and the details insisted on are inartistic and petty; but this is the fault of their authors. They can be made helpful, but no one would ever think of adopting one of them entire for practical use as a working plan. If a plan is good for one place, it is for that very reason unfit for any other, for if it is the best possible for one set of conditions it will be unsuited to another set, and no two places are identical in all their features and relations. Even if it were desirable to reproduce or imitate in the surroundings of one house the effects which have been found pleasing in another, the result would certainly be unsatisfactory. We may repeat without end a fashionable pattern in millinery, but second-hand ideas in gardening are more difficult of adoption. Every shrub or tree has an individual quality, and they refuse to duplicate themselves precisely even in the same soil and exposure, so that it is easier to produce something characteristic and appropriate in any given position than it is to struggle after the reproduction of any landscape-picture, and, in the end, only succeed in making a parody of the original.

After all, the minutiae of planting, especially of such planting as is termed decorative, is a matter of subordinate importance. It is the fundamental design, the way in which the house and grounds and approaches are framed together, and not its ornamental appendages, which determines the essential character of the place. It is the adjustment of these controlling elements which demands special study in every individual example; and although, as has been said, ready-made plans may offer suggestions and exemplify principles, every successful treatment of a house and its surroundings is original and, in a measure, a new creation. It is our belief that the production of such a design is an object worthy of the study of a trained and conscientious artist. Without the thought of a competent designer in a unified plan of dwelling and grounds, the varied wants of a modern household will not be adequately provided for nor its convenience assured. To secure these advantages in full measure is surely worth all the special study which each individual instance can demand, and this is especially true since it is possible, in addition to making the most of every opportunity in the direction of health and comfort, to make the place perennially attractive to the eye of cultivated taste.

WE quote the following paragraph from an editorial article recently published in the *American Architect and Building News*, knowing that other suburban communities, beside those in the neighborhood of Boston, are suffering from the evils therein set forth :

The operations of the Boston Board of Survey, which is authorized by law, on petition of the majority of property-owners in any part of the city, to lay out streets to the territory concerned, establish grades, and construct the streets, assessing the cost on the owners of the land, have attracted the very favorable attention of the inhabitants of the neighboring towns, and Brookline, the richest and most prosperous suburban village, has already voted to petition the Legislature, at its next session, for authority to establish a similar Board of Survey, with the same powers. As the contrast between a systematic, economical and convenient method of laying out streets, and the extravagant, ridiculous, and, in one word, idiotic practice at present in vogue in the other neighboring towns grows more glaring, the example of Brookline will probably be widely followed, and then, at last, will the very important suburban portion of Boston enter upon a period of substantial development. As we once mentioned, out of a total of about one hundred streets in one suburban district, which fairly represents all, more than forty are culs-de-sac, or return to the point from which they started; and every year adds considerably to the number of abortions, while the laying-out of a street which can be passed through, to reach any other point, usually requires the intervention of the County Commissioners, and is an extremely rare event. The consequence is that driving through the Boston suburbs is to a stranger generally one of the most exasperating experiences of his life. Starting, let us say, on a country road, which, however, soon takes a direction away from the point he wishes to reach, he endeavors to find a transverse street which will lead him toward his destination. Of what appear to be transverse streets there is no lack, but to find a navigable one, so to speak, is quite a different matter. Three-fourths of them, in some of the towns, are marked with the warning "Dangerous," and the prudent charioteer takes care not to tempt the perils which lurk within them. Reaching, at last, one without the alarming sign, he turns into it, and drives a few hundred yards, when he reaches a fence, at which the street terminates, either in a neat oval, or a jungle of weeds. Turning, with difficulty, he makes his way back to the high-road, and proceeds, getting always farther from the place he wishes to reach, until he finds another promising-looking street. This, on trial, proves to describe three sides of a square, and conducts him back to the high-road, half a dozen rods beyond where he left it. The next street that looks feasible takes him, between two rows of handsome houses, straight to a pond, and, unless his horse and carriage are adapted for swimming, there is nothing for it but to return to the high-road again. The next public way, perhaps, brings up against a gravel-bank, and another, beautifully macadamized, leads him to a circular park, from which there is no other outlet. By the time he has studied the varied topography of all these specimens of suburban engineering, the day has nearly passed, and he returns to his starting-point with thoughts upon suburban town governments which would hardly bear expression. Of course, the natives understand that the reason why Arlington Avenue comes to a dead stop under a tree is that the owner of the land beyond the tree went back on his promise to extend it through his property; and that Smithdale Street forms three sides of a square because Mr. Smith only had six acres of land, and wanted to have his street all on his own ground; but the knowledge of these personal matters does not do much to console the people who would like to use these avenues for the purpose of getting somewhere, and not as subjects of ethical study; while even the tax-payers, when they find themselves confronted with a heavy appropriation for extending a few of these culs-de-sac to a proper outlet, begin to regret that means could not have been found for having the proper disposition made at the outset. Such a means the citizens of Boston have now provided in their Board of Survey, and, although it has only been constituted a few months, it has shown itself of such immense utility that the general feeling of the citizens is one of deep regret that they have not thought of it before.

Though Nature is constantly beautiful she does not exhibit her highest powers of beauty constantly, for then they would satiate us and pall upon our senses. It is necessary to their appreciation that they should be rarely shown. Her finest touches are things which must be watched for. Her most perfect passages of beauty are the most evanescent.—*Rushin*.

Notes of a Summer Journey in Europe.—IV.

A VISIT to Pallanza naturally includes the far-famed Borromeo Islands, which lie directly opposite. I had only opportunity to visit Isola Bella, a heavy thunder-storm preventing a visit to Isola Madre, which is said to contain some interesting trees. While the terraced gardens of Isola Bella, established two hundred years ago, contain many specimens of interest to an arboriculturist or dendrologist, the whole place is so painfully artificial that one cannot help wishing the fine trees were in some freer, more natural situation. Yet, no doubt, these ten terraces (built on a barren rock, as the guide-books tell us), with their grottoes, fountains, statues and other artificial embellishments, all contributed to complete what in one epoch was considered high-art in gardening. There are many signs of neglect and decadence, and the average visitor is likely to be disappointed in both palace and grounds; indeed, it may be said that the trees and shrubs are the objects best worth a visit to the island, unless it be to get an object-lesson in the taste of past times and to see how thoroughly ugly an artificial garden may be. On approaching the shore one of the most interesting groups noticed is a cluster of some twenty-five or thirty trees of our southern Magnolia (*M. foetida*), which were flowering freely at the time of my visit. These trees are from forty to fifty feet high, and, though crowded together, they were the best group noted anywhere. Among many other specimens, which the gardener points out to every party he conducts, are Cork Oaks (*Q. suber*), three or four feet in diameter of trunk; the tree known as *Cryptomeria elegans*, which here proves quite hardy and very beautiful; a common Laurel, or Sweet Bay-tree (*Laurus nobilis*), whose age is counted by centuries; *Araucaria Brasiliensis*, with a stem a foot and a half through, and also a good representative of *A. Cunninghamii*. Of the genus *Eucalyptus* there are fair-sized trees of several species, some of them being in flower at this time (July 24th). Large Camphor-trees occupy a conspicuous place, and, of course, the Deodar and Cedar of Lebanon are not left out, for without these no such garden would have been considered complete. Some Acacias thrive in the open air here, and so do great Oleanders. *Hovenia dulcis*, which we have not yet been able to grow at the Arboretum, is here almost thirty feet high. As it grows in the Himalayas and Japan, as well as in China, it is possible that somewhat hardier forms may yet be introduced.

Citrus trifoliata is in fruit at fifteen feet in height; an example of one of the Club Palms (*Cordyline [Dracæna] indivisa*) has reached a stature between twenty and twenty-five feet. There are not so many American plants to be seen here as about Pallanza; but among others were noted large bushes of our Candle-berry (*Myrica cerifera*), while a great specimen of the Trumpet Creeper (*Tecoma radicans*) has a stem a foot in diameter near the base. Another *Tecoma*, the handsome flowering Japanese *T. grandiflora*, fifteen years planted here, was just opening (July 24th) its first flowers of the season. A little-known Asiatic climber of the Pea family, *Pueraria Thunbergiana*, is here growing to a great height on one of the walls.

I observed in the vicinity of Pallanza that the Forsythias were bearing a great abundance of fruit. It is perhaps owing to late frosts that these plants, in colder regions, rarely bear many pods or perfect much seed.

After Pallanza, Berlin was the next point where an extended stay was made; but stops were made at Zurich, Munich, Leipzig and the establishment of Dr. G. Dieck, at Zæschen, near Merseburg. The journey by rail over the St. Gothard route does not afford much entertainment from a botanical point of view; but the sail through Lake Lugano, on the way to the St. Gothard line station at Lugano, and the glimpses of mountain and valley one gets from the train, are alone well worth the journey. Lake Lugano is a little gem, surrounded as it is by hills and mountains clad with green from summit to the water's edge, yet within sight of snow-covered peaks. The principal occupations of the district are the cultivation of fruits and the entertainment of foreigners. If natural surroundings, climate, etc., count for anything, it would seem as though a finer race of men and women should be developed here than in less-favored regions.

After passing through the St. Gothard tunnels one sees the mountain-sides marked at frequent intervals by narrow perpendicular scars. These are slides where logs are run down. But with the cutting of timber here there is also some systematic reforestation, especially of Spruce, on the lower slopes. The Fig lives fairly well in the open air in many places about Lake Lucerne, but at Vitznau the plants had been much killed by the severity of the past winter. Few botanical notes were

made until Zurich was reached, and the visit to the Botanic Garden here was made during almost continuous rain. This Botanic Garden is one of several Swiss cantonal establishments of the kind, others being at Geneva, Basle and Berne. It was established about fifty-five years ago, and is one of the very few gardens which make a practice of selling plants and seeds, and it has done so from the beginning. The garden is apparently much frequented by the local inhabitants; but it is not maintained at a high standard, and does not contain much of interest to a foreign visitor. The herbaceous collection is comparatively small and uninteresting; even the Alpine Garden is disappointing, and there are few trees worth special mention. A large tree of *Cryptomeria Japonica* had its tips browned by the severity of the past winter, when the frost was unusually severe, the thermometer registering eighteen degrees below zero (Centigrade) and the lake being frozen over, a rare event.

The Cucumber-tree (*Magnolia acuminata*) thrives as well here and grows as large as it does when planted at Boston, while *Sophora Japonica* is of good size, with a trunk two and a half feet in diameter. This *Sophora* appears to be one of the most commonly distributed of all Japanese trees in European gardens.

One of the most interesting trees in the garden is a specimen of the Clammy Locust (*Robinia viscosa*), labeled under its synonymical name of *R. glutinosa*. This has attained a size not often seen in this species, being perhaps forty-five feet high, while the stem is about fourteen inches in diameter at four feet from the ground. A specimen of the Cephalonian Fir (*Abies Cephalonica*) has a trunk two and a half feet in diameter, while its branches spread twenty feet in each direction.

Lindens, of several species, are largely planted as street trees in Zurich, and the air was fragrant with the odor of the blossoms. One of the shrubs which attracted my particular attention here, and which was also found in several of the squares of Geneva, proved to be *Spiræa Lindleyana*, a Himalayan species too tender to live and thrive well in the climate of eastern Massachusetts, except, perhaps, in the warm southeastern corner of the state. Under some circumstances this species might be mistaken for the common *Spiræa sorbifolia*, of which, indeed, it was once considered a variety. But the common and hardier species is much more dwarf in habit than *S. Lindleyana*, which, at Geneva, was growing in clumps, and ten or twelve feet in height. Moreover, the common species blossoms earlier, and is quite out of flower before Lindley's *Spiræa* begins. The huge panicles of flowers of the latter are usually somewhat flattened or fan-shaped, while in *S. sorbifolia* they are cone-shaped or pyramidal. The leaves, too, are very distinct. *S. Lindleyana* should be a valuable acquisition where the winters are not liable to be any more severe than at Washington.

Arnold Arboretum.

J. G. Jack.

An Evergreen Shrubbery.

I HAVE often wondered why so few broad-leaved evergreens are planted for winter effect. Perhaps the northern climate is too trying for the best of them, but, south of Washington, the list of these plants suitable for cultivation is a large one. Our climate in this section of West Virginia is colder than that of Washington. We have a good deal of ice and snow, and sometimes the Potomac River, which is but a mile away, freezes over, so that one can skate from West Virginia into Maryland. In our grove at Rose Brake we are now testing a number of broad-leaved evergreens, but cannot yet speak in assured terms of their hardiness.

Nothing adds more to the attractiveness of our home grounds at this season than groups of Mahonias, Laurels, evergreen Thorns and similar plants. In this neighborhood the English Laurel flourishes and becomes a large bush or small tree, with charming foliage of a lively green, reflecting the sunlight from its polished surface.

In the Mall, in Washington, thousands of broad-leaved evergreens are planted, including many Aucubas, which seem perfectly hardy there. These I have never tried, as I think them the least pleasing of their class. Their blotched appearance soon wearies the eye, yet if there were only plain green-leaved Aucubas they would be much handsomer and really very valuable shrubs. The yellow variegation is no objection in the eyes of those who admire variegated Altheas, Dogwoods and Weigelas, but my own taste leads me to use this class of shrubs sparingly, for many of them together produce an unnatural effect.

We have tried some interesting experiments at Rose Brake

with plants that are usually considered too delicate to stand the winter in open ground. We leave all Gladioli in their beds with no cover but the leaves which the autumn winds spread over them. One bed, however, which has no large trees in its neighborhood, is left uncovered, and yet the Gladioli live and increase from year to year, and I cannot see that they deteriorate under this rough treatment. *Hydrangea hortensis* has survived several winters with no protection at all. We are now testing *Chimonanthus fragrans*, the Deodar Cedar and *Phillyrea Vilmoriniana*, all duly tucked in with a coverlet of leaves, kept in place with branches of trees. Our small specimen of the great Southern Magnolia has a house made out of a barrel, from the top of which the leaves protrude, green and smiling. Next year I mean to adopt Mr. Massey's suggestion and try the experiment of leaving a *Pittosporum* in the evergreen shrubbery throughout the winter, as he writes that it withstands severe frost in North Carolina.

We have a beautiful Japanese Acacia, *A. Nemu*, now six years old, and it has never winter-killed nor led us to believe that it was not as comfortable in its winter quarters as our hardiest trees. It is about twelve feet in height. Mr. Parsons recommends cutting this Acacia down to the ground every year, but this we find quite unnecessary.

For the evergreen shrubbery the catalogues name varieties of evergreen Thorn, a half a dozen *Andromedas*, *Azalea amœna*, *Berberis dulcis*, many varieties of Box, three or four *Daphnes*, besides *Cotoneasters*, *Ilex opaca*, *Sedums*, the common Inkberry, Furze and two kinds of Irish Heath, *Menziesia polifolia* and its variety *versicolor*, which bears pink flowers. From these a selection can be made for a beautiful shrubbery. Backed by groups of Hemlocks, Pines and Spruces on the north, as a protecting rampart against the cutting winds of winter, such a shrubbery might be a delight to its owner, and rival Addison's favorite evergreen garden, loved by the birds.

The different Boxes seem to me too stiff to be altogether pleasing, but that is a matter of taste. I have some very old Box-trees bordering the paths of my vegetable garden, whose antiquity protects them; but I have set out no young specimens in my shrubberies. Instead, I have hardy Oranges, which I think much prettier. For vines we have the Chinese Honeysuckle and the climbing *Evonymus radicans*. Bitter-sweet is very appropriate to the winter shrubbery, as its berries hang on late in the season, and it forms a pleasant contrast to the heavy foliage of the evergreens. A few Birches are planted here and there among Pines and Spruces for the effect of their white bark, and some rare deciduous shrubs and trees further relieve what might else be the sombre effect of the evergreens alone. *Yuccas* we find very valuable, and have many clumps of several varieties. *Yucca filamentosa*, *Yucca gloriosa*, *Yucca recurva*, *Yucca angustifolia* and *Yucca flaccida* seem unaffected by the snow and ice that surround them, and are a cheerful light green that contrasts well with the darker foliage of our Mahonias, Rhododendrons and Hollies. *Yucca filamentosa* is, however, the only one we have thoroughly tested, as some of the others are now enduring their first winter in open ground.

Evonymus Sieboldii is a choice shrub for winter effect, with its profusely borne orange-red berries and its clean, healthy foliage, and the Scotch Broom, *Cytisus scoparius*, is certainly hardy; and, though it is deciduous, we have given it a place among the evergreens because of the cheerful color of its branches, and its graceful, half-weeping habit. The new variety of this charming plant, which is mentioned in GARDEN AND FOREST, vol. iii., p. 273, as *Cytisus scoparius*, var. *Andreas*, ought to be an acquisition if it were hardy here. It is described as follows: "The bright yellow of the standard and keel of the flowers and the rich velvety maroon of the wings are most effective. It is as easy to cultivate as the type and flowers when only a foot high." Our common Broom flowered when very small, and is a sunny, cheerful plant at all seasons, hardy and brave.

Is it the common English Hornbeam which Addison means when he writes of his garden: "The walls are covered with Ivy instead of vines. The Laurel, the Hornbeam and the Holly, with many other plants of the same nature, grow so thick in it that you cannot imagine a more lively scene"? The English tree as I know it is not very unlike our own blue Beech, a most attractive and small tree. But why is it named in this company?

Following a suggestion in a recent editorial in this journal, we shall plant some scarlet-twigged Dogwoods and *Kerrias* in our winter shrubbery, and to make it complete we should carpet it with Ground Ivy, Winter-berry and Partridge Vine.

All this will come in time. At present we have a great deal of Periwinkle, which we find of an encroaching disposition, but very desirable for planting under the shade of evergreens where grass will not flourish. In some catalogues *Osmanthus illicifolius* is included among hardy evergreens. This, with many others, I hope to report on in future. Meanwhile I am sure that any of your correspondents who have facts as to the established hardiness of any shrubs of this sort which are not generally planted will oblige many readers by giving their experience.

Rose Brake, West Va.

Danske Dandridge.

Winter Rambles in the Pine-barrens.

IN articles in GARDEN AND FOREST of last year some of the characteristics of the Pine-barren flora, as seen at the head of Lake Michigan in the winter, were described. There are additional features, especially in connection with deciduous trees and shrubs, equally attractive to the botanist and observer of wood scenery at this season.

Though a familiar tree throughout the eastern United States, and ranging from the Gulf to our northern limits, the Tupelo, or Pepperidge, as it is better known at the west, is not generally abundant, though frequent in some localities. In the Pine-barrens it is seen in the narrow strips of swampy ground or by the borders of the sloughs, where it grows singly or in small groups. As it is apt to stand apart from trees of a similar height, rising from clumps of Willow and Alder, or other lowland shrubs, its isolation helps to emphasize its singularities, and here it is the most picturesque tree of the lowlands, or even in the landscape as a whole. None of its associates has so marked an individuality or a form so strongly outlined. The crooked and elbowed limbs, mostly sloping downward, give the Pepperidge a more pronounced appearance when leafless, since they are abundantly provided with short stiff twigs nearly as stout as thorns. When the longer branches are near the top, making a flattish crown, it resembles a great parasol. Its striking characteristics lead to its easy identification as far away as the eye can make out its form. The largest of the trees here have a girth of but six or eight feet, and are rarely more than fifty feet high, their trunks often bushy with short adventitious branches below the principal limbs. Thickets of shrub-like trees are common, where the stiff twigs and limbs make them almost as difficult to penetrate as a hedge. It is not always a graceful tree, but when covered with glossy leaves in summer has a rare beauty, and when they assume the crimson hues of autumn it vies with the Sumachs in being the most brilliant object in the autumn woods. Sometimes it assumes a symmetrical and very handsome form, with long lower limbs, and those above gradually shortening to near the top. With limbs so sloping as almost to droop, and coming so near the ground that their ends blend with the low shrubbery beneath, we see a tree when covered with glossy foliage as beautiful as any in the forest.

The Paper Birch, a more common tree and always a graceful one, is found in similar situations, but in poorer soil. It rarely exceeds thirty feet in height, though in some of the more fertile spots, where it shares the ground with the White Pine and Elm, may be double this height. It springs up quickly where the ground has been overrun by fire, making thickets of straight, slender trees. The slim white trunks, frizzled as they grow old with loose bits of papery bark, are in sharp contrast with all about them, striping with bands of white the background of darker shrubs and trees. But when standing alone, or when grouped with others of its kind, the intensity of contrast is toned down, and it presents a most attractive picture. The smooth bark of the limbs, and on the trunks of the young trees, is of a lively chestnut-brown, speckled with small gray dots, also contrasting effectively with that of the white bole and larger limbs. The cylindrical catkins stand out a little stiffly in twos and threes at the ends of the twigs, presenting a fork-like appearance very different from that produced by their long and pendulous habit in spring. Sometimes the tree closely resembles the Cut-leaved Birch, with a light and airy spray, drooping when heavy with leaves and forming a flowing outline. It gives a striking effect of local color when seen in rows bordering some of the long, straight sloughs, which run like avenues of water through the thin woods, and the lines of white, formed by the bright trunks, fade into the distance as the eye follows them down the vista.

Rivaling the Paper Birch in the color-effects of its trunk is the American Aspen (*Populus tremuloides*). It also grows up rapidly in the damper ground of burnt districts, where the smooth, greenish white bark of the slender trees shows conspicuously. The green tinge becomes less marked as the

trees increase in size, and the bark assumes an ashen, or even clay color, but always in strong contrast with the mass of trees around, especially in the winter-time when stripped of leaves.

A near relative of the Birch, the Speckled Alder (*Alnus incana*), is one of the most common of wet-ground shrubs. The smooth stems, with polished, reddish green bark, speckled with gray, show finely in the winter season. The recent shoots are reddish gray, slightly downy, and marked with numbers of small, round yellowish dots. The buds are prominent, of a dark purplish color, and have a shining, waxy coating. Being raised on short, thick stalks, they are somewhat club-shaped. The cylindrical aments are already formed, for it is one of the first shrubs to bloom in spring. They are about an inch long, and hang in clusters of three to six at the ends of the branchlets. Since the bearing shoots curve near the end, the aments almost always point downward, quite in contrast with those of the Birch, standing stiffly outward, and less graceful in this respect than the Alder. They are reddish brown mottled with green, and by their color and position give this shrub features by no means devoid of beauty.

Englewood, Chicago, Ill.

E. J. Hill.

New or Little-known Plants.

Chrysanthemum, Walter Hunnewell.

THIS seedling Chrysanthemum bloomed for the first time in the autumn of 1890. It is the result of a cross between Mrs. J. C. Henzy, a yellow-flowered variety, and Sachem, a bronze. I had a plant of it in a six-inch pot, grown to a single stem, in order to test its bloom, a plan, by the way, which was recommended by Mr. Gerard, in GARDEN AND FOREST, as the best means of testing the flowers of seedlings so as to avoid the necessity of taking up the whole plant. Nevertheless, the seedling's habit of growth was so remarkably distinct that the original plant was lifted, but when it bloomed it did not seem worth keeping, except to use as a parent in future crosses, so that its strong habit could be perpetuated. However, Mr. A. H. Fewkes, of Newton Highlands, persuaded me to give it a trial, and assisted me in the second test. The result was a remarkable improvement on the first year's showing, and Mr. Fewkes secured some superior flowers. Mrs. Henzy, the seed-parent of the new variety, was sent out a few years ago. It has a neat, incurved Japanese flower and a dwarf habit. Its constitution is weak, however, and unsuited to single blooms of a large size, such as are now fashionable, so that it fell out of the ranks and is seldom seen. The pollen-parent, Sachem, was raised by Dr. Wolcott. It bears a semi-double flower, and its only recommendations were a vigorous constitution and an admirable dwarf habit. The flower of Walter Hunnewell (see page 17) is a good orange-yellow, having the finely incurved form of its seed-parent, and the plant shows the distinct and vigorous constitution of Sachem. The flowers are solid enough in texture to keep them from fading, and for pot-culture the variety is an ideal one. It has marked individuality in its good foliage and erect habit, and needs very little staking to keep it in perfect shape. In my experience, also, it produces a greater percentage of crown-buds than any other plant with which I am acquainted.

Wellesley, Mass.

T. D. Hatfield.

Cultural Department.

Iron-clad Roots.

IN a recent issue of *Rural Life*, Professor Budd, of the Iowa Agricultural College, discusses the subject of root-grafting with both long and short cions and roots, and expresses a preference for long cions on long roots. Of course, this kind of graft, planted as the Professor plants them, with only the top bud of the cion above ground, requires deep preparation of the soil, and a good deal of hard digging in taking up the trees. But he believes that the extra cost and trouble are more than recouped by a much better growth and a much smaller number of second-class and unsalable trees. I am inclined to agree with Professor Budd on this point; and just here I venture to give a warning to the growers of iron-clad fruits in the nurseries of New York and other states outside of the "cold north."

A little more than one year ago the propagators of the new winter iron-clad Oldenburgh-seedling—first known as Dudley's Winter, but since renamed North Star—kindly sent me two trees for trial. I had them carefully set out, but one is already dead, and I can save the other only by banking it in the fall. I did not set them myself, nor unpack them, and the man to

probably one reason why "New York trees," even the hardiest Russians, are so widely unpopular in the cold north.

Without the least doubt, so long as we are compelled to work our iron-clad tree-fruits upon tender stocks we must put and keep these stocks well down beneath the surface, or mound them up, or mulch them heavily, and keep them so.



Fig. 4.—Chrysanthemum, Walter Hunnewell.—See page 16.

whom I entrusted the work failed to notice that they were both budded, four or five inches from the ground, on what have proved to be tender stocks. It is needless to say that no grafted or budded tree can survive its stock, and unless buyers are warned to plant them very deep the trees of this Apple will be denounced, when put upon the market, as a fraud, so far as its supposed hardiness is concerned. Such high working is

In nursery work this principle has long been well understood by growers in the iron-clad region; and it is this necessity which has led to the practice, in root-grafting, of working long lions on short roots. The subject has been debated in our horticultural publications and meetings with a good deal of energy, and both nurserymen and orchardists outside of the cold north have taken part in the debate, not always with a

clear view of the entire situation. The matter of this so-called "whole-root" grafting, which really means the use of a longer or shorter top-cut of the root on which to work the cion, was started by a Missouri nursery firm, and could hardly have originated where the necessity of putting the tender root as far beneath the surface of the soil as possible is fully comprehended.

The necessary depth for planting out grafts of iron-clad varieties, worked on roots grown from seeds of tender varieties, can only be gained by the use of long cions, and these must extend far enough below the surface to insure sufficient moisture about them to cause the putting forth of strong roots from the cion itself. Success in this depends upon the height of permanent moisture in the soil. In northern New England so great a length of cion is not needed for this purpose as in many parts of the west, and especially in the dry states like Kansas and adjoining portions of Missouri.

But why is so little said yet about using iron-clad seedlings for stocks? Is there any good reason to suppose that the seedlings of Oldenburgh would not be as hardy as their parent? Have we not sufficient ground for believing that if we plant the seeds of the iron-clad Apples of north central Russia, the seedlings grown from them will be sufficiently hardy to be used and planted in the same way as more tender seedlings are in a milder climate? Not only for root-grafting, but for budding, will not Oldenburgh-seedlings serve and answer all our needs in the cold north? I read nearly everything I can get hold of on these matters, and have sets of the proceedings of all the horticultural societies of the cold north; but I do not recall any discussion or even mention of so important a question.

It is very doubtful whether our American iron-clads, which are, so to speak, mere accidents, could be reasonably expected to give us reliable seedlings for this purpose; and I should not care to plant seeds of Astrachan, or any apple of south Russia, to grow stocks for budding, or even grafting. But I believe it is fully time to begin some exhaustive tests to settle this not unimportant problem. Some may ask why so little has been done about it. I can only say, for myself, that as I have a ready sale for all my Russian apples, and never have ground any for cider, I have always sown the ordinary Apple-seeds obtained from dealers. But I mean to keep the matter in mind, and I write this to urge the same course upon others.

Newport, Vt.

T. H. Hoskins.

Anthracnose in Bean-seeds.

I HAVE received a letter from a large seed-house asking for information concerning the anthracnose in Bean-seeds, and Mr. Lyon, in his article, "Damping Off," in GARDEN AND FOREST, vol. iii., p. 599, virtually requests the same thing.

The fungous disease of the Bean has been known for many years, and my purpose here is only to record a few observations and suggest a feasible method of avoiding serious trouble.

The fungus (*Colletotrichum Lindemuthianum*) most frequently attacks the pods of the bean when they are partly grown, forming deep dark pits and lessening the yield. The fungus spreads rapidly, from pod to pod, in the market-place, and a spot may be established by inoculation upon an otherwise healthy plant in thirty-six hours. Whatever may be the true life-history of this fungus, it is certain that it can exist from one season to another in the mature beans themselves, and when these diseased seeds are planted the best possible condition is given for perpetuating the disease.

Beans of various sorts were examined, and a large percentage of some of the Wax sorts were found defective, particularly in the region of the eye. Instead of the natural color and plumpness, the coat would be brown and wrinkled. When such beans were split open the rusty appearance would be found extending half-way through the seed. By placing such imperfect beans in a dish in a moist chamber and keeping them moist, a rank growth of the fungus quickly developed upon the diseased portions and rapidly spread over the healthy portion of the seeds. The spore-patches were often so abundant as to almost completely cover the surface of the beans, and the spores developed in countless numbers. As a rule, bacterial fermentation soon after set in, and the small heaps of halved beans became offensive masses of decay. This only shows that the beans are rich in those substances enjoyed by the fungi, hence the rapid development of the anthracnose. A more careful examination of the diseased beans when first split and before they had remained for a time under favoring conditions, showed that the surface in some instances was already studded with the spore-masses, thus demonstrating that the

dry beans in the market and seed-stores may be infested with the disease.

The next point was to note the behavior of the seedlings. Those from good seed came up promptly and looked well, almost without exception, but only half of the diseased seed germinated under the same conditions, and the plants were sickly and spotted with the disease. Several of the plants were so badly infested that there was scarcely a healthy place to be found from the root to the leaves. From such plants it was an easy matter to introduce by a needle the infection into the tissues of a healthy stem.

The next step was to test the value of treating the diseased seeds with some fungicide, and it was found that the best results were obtained by soaking the seed for one hour in a solution of three ounces of the carbonate of copper, one quart of ammonia-water, and four and a half gallons of water—that is, five times the strength of the standard solution for grape-rot. From comparative tests it can be safely stated that the product from untreated seed was diseased four times as much as that from the copper-soaked seed. These experiments teach that one method of reducing the disease is to have seed that is free from the anthracnose. This cannot be ascertained without a microscopic examination, but a brief soaking in a fungicide, while it does no apparent harm to seeds free from the disease, has the power of greatly reducing the amount of it in plants from infected seed. Unlike spraying plants in the field, the soaking of the seed is a simple and very easy matter, done once for all at the expense of a few cents for an acre; and, therefore, this method is recommended wherever the disease threatens the crop.

Rutgers College.

Byron D. Halsted.

The Carnation Rust.

THE note by Professor Halsted on the Carnation Rust (vol. iv., p. 596) has called forth many letters, from which it appears that this fungus, *Uromyces caryophyllinus*, has already



Fig. 5.—*Uromyces caryophyllinus*; pustules on the stem and leaves of a Carnation.

obtained a very wide distribution in this country. It is said that some of the growers along the Hudson River have known of this pest for three years. Professor Galloway, of the United

States Department of Agriculture, writes that rather more than a year ago he had received from Professor Taft, of the Michigan Agricultural College, Carnation-sprigs badly affected with this fungus, and he then wrote that, so far as known, *Uromyces* had never before been found in the United States. He added that it might prove troublesome if it once gained a foothold, and therefore he thought it well to call the attention of florists to it. We learn of it in Michigan, Ohio, the vicinity of Philadelphia and other parts of Pennsylvania, and in the neighborhood of Boston.

Little can be added to what has already been said as to the effects produced on the plant by this fungus. In order to make it easy of identification we herewith reproduce two figures from Briosi and Cavara's work on the *Fungi of Cultivated Plants*, which Professor Galloway has been kind enough to send us, so that all growers may be able to identify the disease. On page 18, Fig. 5 shows a sprig of Carnation affected with the rust, with the pustules appearing on the leaves and stem. A thin cross-section through a leaf-pustule is represented in Fig. 6, from which it will be seen that the spores (a) are borne on short stalks.

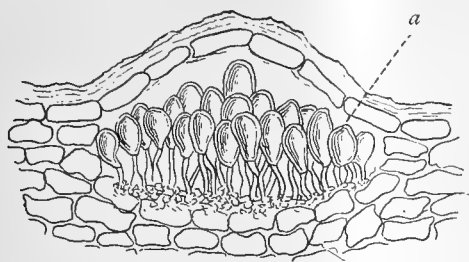


Fig. 6.—*Uromyces caryophyllinus*.—See page 18. Cross-section of pustule. a, Spores.

Where Carnations are kept cool and dry—that is, with abundance of light and air—it does not spread so rapidly nor grow as vigorously as it does under other circumstances. It is worse in those portions of the greenhouse where the pipes are hottest. Some varieties are much more susceptible to the disease than others. Mr. E. G. Hill, of Richmond, Indiana, finds that the heavy-growing and fleshy-leaved varieties suffer the most. Mr. Lonsdale advises that great care should be taken in selecting cuttings for next year's plants, and these should be treated to a dip in some fungicide, like a weak solution of the Bordeaux mixture, before they are inserted in the propagating-sand, and they should be sprinkled once or twice a week afterward to keep it in check. Of course, such ordinary precautions as picking off the diseased leaves, removing diseased plants, and keeping young plants as far as possible from old ones which are supposed to be infected, should not be neglected. One grower writes that he fears that the Bordeaux mixture will poison his soil, a possibility which has been suggested by Colonel A. W. Pearson in this journal. But Colonel Pearson also suggested that the copper mixture could be used for Grape-rot in a much more diluted form, and it is not improbable that experiment would show the same to be true in the case of this fungus. Besides this, it is not likely that the soil in the pots or benches would become sterilized by the cautious use of copper within three or four years, even if there was a genuine danger from this source, and as greenhouse soils are frequently changed, this danger should not forbid the use of the copper mixtures.

Fuchsia, Dunrobin Bedder.

IT is a great gain to secure for the garden a dwarf hardy Fuchsia, free, compact and useful either as an edging to large beds or by itself to form a distinct group on the grass. We have such an acquisition in the variety Dunrobin Bedder, a form of the popular *F. Riccartoni*, one of the hardest and most beautiful of Fuchsias; it was raised by Mr. Melville, who has charge of the interesting gardens at Dunrobin Castle, Sutherland. He hybridized *F. Riccartoni* with the greenhouse varieties, and out of about one hundred seedlings which he managed to bloom this was selected for its unusual dwarfness, compactness, vigor and freedom of bloom. I first noticed it in the gardens of the Royal Horticultural Society, Chiswick, where it had been sent for trial, and was impressed by its distinctness and beauty. It is perfectly hardy here—at least it has withstood the trials of ten winters in Sutherland. In seasons of exceptional severity the plants are cut down to the ground, but not killed, and they grow freely again with the quickening

warmth of spring. Its great charm is as a bedder, and it may be used for edging or as a groundwork to a bed of taller Fuchsias. Mr. Melville propagates this Fuchsia in the same way as ordinary bedders—that is, by putting in several cuttings in a five-inch pot in August or September. To obtain an early display of flowers the cuttings are potted off singly in the following March, and a quick return in the way of bloom is secured. The old specimens will also provide a feast of color if they are lifted before touched by frost, placed closely together in a cold frame, and pruned a little in the late spring before again occupying their place in the garden. Many uses for a dwarf, hardy, vigorous plant like this will suggest themselves, and we have seen it used to advantage as a window-box plant, also in large vases.

Chiswick, England.

Vincent Cook.

Hybrid Violas.—Now that the owners of gardens are making preparations for the spring and summer allow me to suggest the trial of hybrid Violas, or, as they are sometimes known, the Tufted Pansies, which do not seem as much cultivated as their merits deserve. These plants are hybrids of various alpine Violets with some admixture with the florists' Pansies. While some of the varieties have the tufted habit which has led to the naming of the race, this habit is not universal, and most growers favor the "Hybrid Violas" as a more correct name. The present race of Pansies is the result of long-continued selection, having always in view, as one of the main points, the increase of size. While mere size is not objectionable, a large proportion of modern Pansies are coarse, with colors very much blurred or run. Of course, there are fine collections of Pansies with pure clear colors well defined and very satisfactory in every point of view. The hybrid Violas, while much resembling Pansies in foliage and growth, are quite distinct in effect, having a beauty of a daintier order. The flowers, similar in form to good Pansies, are usually about half the size, and are, in good varieties, without a trace of coarseness in texture and of the most satisfying purity of color, to which good qualities many of them have in addition a delicate yet distinct fragrance. They are very free-flowering and make capital bedding plants. They can be planted out as early in the season as the ground can be made ready, being as hardy as the Pansy. They may be secured from any English hardy-plant nursery, and it is well in ordering to arrange for their coming by mail, a much surer plan for soft plants than the express, with the long delay at the customs. Some of the best kinds in cultivation are Countess of Kintore, Quaker Maid, Ariel, Skylark, Violetta, Countess of Hopetoun, Duchess of Sutherland, Sir Joseph Terry, Archie Grant, Puritan, Ardwell Gem, King of Yellows.

Primula floribunda.—This Himalayan Primrose is one of the brightest of greenhouse flowers, and much more attractive in color than *P. obconica*. Nothing brightens up a garden as much as masses of good yellow flowers, and the color of this Primrose is of the clearest deep golden hue. As its name implies, it flowers freely and continuously. While the scapes are not as hard and rigid as those of *P. obconica*, it is useful for cutting for dainty flower-arrangements. It is readily grown from seed, which germinates rapidly, and seems to thrive in a moderate warmth and not too moist an atmosphere. Some plants in cooler quarters have not been quite happy, and probably from fifty degrees to sixty degrees Fahrenheit is a suitable temperature. The type of this plant has small flowers, but there is a variety with large ones of the same color. It was with regret that I threw out *P. obconica*, after becoming a victim to its irritating spicules, though, curiously enough, I had grown it several years and had not been affected till attention was called to its properties. Aside from this one fault, it is one of the most valuable minor plants, being always covered with pretty, useful flowers. In the hope of filling its place, I am watching carefully a pan of hybrids, *P. obconica* × *P. cortusoides aincena*, from which, I am assured, there will be plants with larger flowers and a range of colors from white to red. This seems a promising cross, though there is more than a suspicion that there will be some of those dreary blue-reds of *P. cortusoides* to weed out. My principal wish is that the cross may ameliorate the structure of the foliage so that it may prove innocuous. With such foliage and flowers larger than the type there would be a gain indeed.

Elizabeth, N. J.

J. N. G.

Galanthus nivalis, var. Octobrensis.—This Snowdrop flowers here from the beginning of October until November, and is then succeeded by *Galanthus Corcyrensis*, the latter opening the first flowers in the first week of November, and continuing for about six weeks. There is not much difference in the flowers,

only the segments of *G. Octobrensis* are a little narrower than those of *G. Corcyrensis*; the principal difference is in their time of flowering, the latter being always four weeks later. We cannot force *G. nivalis*; but when these autumnal sorts have become more plentiful we shall have Snowdrops in bloom from September to April, and as people are always fond of popular flowers at an uncommon time they will find a ready market. Twelve bulbs in a comparatively small pot will make a beautiful group. I may add that by proper treatment and careful selection of seed, they will, in time, improve in form and size, so that the flowers of my best seedlings have segments of over an inch in length.

Baden-Baden.

Max Leichtlin.

The Forest.

Management of the National Forest-reservations.

AT the late meeting of the American Forestry Association, Mr. B. E. Fernow, chief of the Forestry Division, Department of Agriculture, read a paper on this subject, from which we make the following extracts:

The objects for which National Forest-reservations can reasonably be asked are mainly of an economic and not of an æsthetic nature.

The situation briefly is this: The major part of the public domain, which was wooded, has been disposed of without regard to the value of the forest, either as marketable material or as a protective cover. A large part has been and is being wantonly wasted and destroyed by fire every year. Now it is proposed to change this policy. Instead of holding this property in the hands of the Government for eventual disposal, it is intended to withdraw at least parts of it from entry and to keep it in permanent possession and control of the Government, with proper recognition of its special value as being wooded.

The law of March 3d, 1891, authorizes the President to reserve wood-lands, and by public proclamation to declare their establishment and fix their limits.

As far as the law goes, the object of the proposed reservations is left undefined, as well as their number or extent. I may, therefore, only define the objects for which at present they are probably authorized and what the aim and the methods of their management, separate from that of other public lands, should be.

While in the minds of some, inspired with a general love of the woods, the whole forestry problem is more or less a sentimental matter, and the uppermost idea is, that to stop vandalism by the axe and fire, to preserve natural scenery and to create parks for recreation and hunting-grounds, is the aim of the forestry movement, and of these reservations in particular, I must protest against placing these ideas in the foreground. It is perfectly legitimate for a civilized nation to set aside and preserve as national monuments such areas as the Yosemite Valley, the Big Tree groves and the wonders of the Yellowstone Park; but to withdraw large areas of land from private occupancy will be warranted only when well-substantiated, economic reasons for such withdrawal exist, and objects of a more important communal interest are thereby to be obtained.

These objects I consider to be twofold. First, to assure the communities growing up with wonderful rapidity in our western country of a continuous supply of wood material; second, to assure a continuous forest-cover of the soil on hill and mountain-slope for the purpose of stable soil—conditions and equable water-flow. Just as the first of these economic objects can be attained without frustrating the last, just as the forest can be made to yield continuous supplies without destroying it, just so may the æsthetic and sanitary objects be satisfied by the way without need of curtailing the economic ones. These economic objects, namely, continuous supply of timber and such forest-conditions as will secure favorable water-conditions, can alone be considered as the objects of management to be discussed here.

The difficulties which stand in the way of a management that is to secure these objects are of two kinds, namely, those opposed by nature and those opposed by man.

Excepting on the western slopes of the Pacific mountain-ranges, the climate of the largest part of the territory concerned is such as to render forest-management for reproduction and reforestation difficult; this difficulty has been increased by the action of man in barring slopes and burning the fertile leaf-mold, thus reducing the chances of germinating seeds and young seedlings. Difficulties of this nature can be removed only after careful study and experiment in the

field. We will, therefore, have to start with a simple, common-sense management, and will have to leave the development of better forestry methods to future years, providing only the opportunity of gaining necessary knowledge and experience for the best results.

The main difficulties to be met for the present are those opposed by man.

The social and economic conditions of our western mountain states are peculiar, but they are easily understood and explained when we realize that upon their 1,000,000 square miles not quite 3,000,000 inhabitants are to be found, or only three to the square mile, and if we deduct the population of the cities, a little more than three to every two square miles. This scarcity of population, together with the spirit of independence and self-reliance born and remaining from the pioneer days, when each having single-handed to stake out and defend his own homestead, and to provide for himself and family in the wilderness, was under the necessity of using natural resources, accounts for the prejudice against the curtailment of accustomed and at one time necessary privileges. A feeling of freedom is created in him who finds but little friction with neighbors; he becomes a law unto himself, and government, with which he has but little touch, and which does not understand him or benefit him, appears to him often an unnecessary restriction, and he places the laws of necessity, as he conceives them, readily above the laws of the land.

If this spirit exists in the bona fide settler and citizen, it exists to a still greater degree, bordering on absolute lawlessness, in the irresponsible class of adventurers which a new country always attracts, especially when the laws are either incompatible with existing conditions or are poorly and unsatisfactorily administered for lack of discretion on the part of officers or for lack of proper machinery. We cannot deny that there has been much incompetency shown in the administration of the land, and especially the timber question, by the United States Government, so as to lead western communities to chafe under improper restrictions and to believe a change for the better impossible or impracticable.

To make more intelligible the difficulties arising from this state of things, a brief extract from the paper by Mr. Bowers, presented at the last meeting of this association on the Conditions of Forests on the Public Domains, may be of service.

He says: "Under the act of June 3d, 1878, applying to Colorado and the territories, settlers and others were permitted to cut timber for mining and agricultural purposes from mineral land. Before cutting timber for local use the settler can hardly be expected to sink a shaft or hire a chemist to determine whether the land is in fact mineral or not. He cuts where most convenient for him, without knowing what the character of the land is, and takes the chance of being prosecuted. Not one acre in thousands throughout the region to which this act applies is known to contain minerals, but it is the only act under which timber may be taken by settlers and miners in this great region. Consequently this whole population is forced to steal one of the necessities of life. To the miner and settler of that region the use of timber from local supplies is as absolutely necessary as the use of the water that flows by him, or of the air that surrounds him, and no plan of management which fails to recognize this can ever hope to be successful. The settler, after taking a piece of Government land in the vicinity of the mountains, finds immediate use for timber for the construction of his buildings and fences, and he naturally helps himself. The prospector and miner and the great mining companies have the right to cut timber growing on the mineral lands about them; the railroad supplies itself from the adjacent timber, and the settler can hardly be blamed for doing the same. Oftentimes, as a community of settlers becomes sufficiently large to support it, a small saw-mill springs into being, and the wants of this little community are supplied by the local mill, drawing its timber from the Government land without any authority whatever. Both of these classes, the settler and the local mill man, are then criminals under the law, and are also liable in a civil action for damages, but before a local jury prosecutions almost invariably fail.

"The sympathies of the entire community are always with these depredators of the public timber, and quite often the jurors themselves have been freely using such timber. Indeed, it is a matter of the greatest difficulty to induce a grand jury to indict persons who have confessedly been cutting Government timber for years to supply their saw-mills, the product of which is used quite likely by the very members of the grand jury."

One striking difficulty in establishing the reservations themselves is that much of the land that should be reserved is as yet unsurveyed, other parts are subject to prior rights or are

expected to be included in railroad grants. In fact, to make a success of this movement and to establish a thorough-going forest-policy, it will in the end become necessary, not only to reserve all the remaining timber-lands, but also to buy up such interspersed parcels held by private owners as destroy the compactness of the reserves, and thereby impede their economical management.

It is an old experience that the greatest difficulty in breaking up old and introducing new methods comes from the momentum of habit and established usage, and the resistance of the momentum to a change of direction increases with the increase of friction. Hence, to make innovations successful, they must not be made abruptly, but must adjust themselves as much as possible to existing conditions, and be allowed to develop gradually into new systems. The spirit, then, which will oppose any new policy that smacks of restriction, must be overcome by judiciously legalizing such uses as are permissible, and controlling their exercise with the least friction.

To make such a control possible, officers of discretion, tact and, at the same time, strong administrative capacity are necessary, and legislation, devising management, must be content to indicate general principles only, leaving the details to the administrative officers.

The management must provide, (1) proper organization of an efficient service; (2) protection against theft, fire or other damage of the property; (3) regulation of the occupancy and the use of the reservation by citizens; (4) a system for cutting the crop and marketing it according to the needs of the population; (5) reproduction of the crops and maintenance of proper forest-conditions.

The principles which should underlie such management have found expression in Senate Bill No. 1779 of the Fiftieth Congress, and may well serve as a pattern for an administration of less general character.

The modifications, which are necessitated by only a partial reservation of wood-lands into single detached reserves, will suggest themselves. One point needs to be constantly and strenuously insisted upon, which is, that no management can be successful unless it be properly provided with machinery. Without managers there is no management, and without guards there is no protection. Hence a well-organized force of officers is a *conditio sine qua non*. As usual, it is the question of men, not of measures, that presents the real difficulty.

Mr. Fernow then proposed a system of administration of which we only have space to give a mere outline. The reservations should be under a central bureau co-ordinate with the General Land Office and under the Department of the Interior. Each reservation should be controlled by a responsible superintendent, assisted by an adequate force of rangers, each of whom is responsible for a district. Management of forest-property especially requires permanence, and therefore superintendents should have positions during good behavior, and the rangers should be appointed with their approval. As an additional safeguard, inspectors should be appointed, each of whom should have a number of reservations under his charge, and, by visits and otherwise, keep the central administration advised of local needs. In the matter of regulations, provision should be made for restoring agricultural lands to settlers; for giving opportunities to prospect for minerals; for issuing permits for hunting and fishing; and licenses for timber-cutting under proper restrictions. But whatever scheme of administration is devised it must be simple, tentative, capable of development into a more comprehensive system, with the application of finer methods of forestry added as experience shall teach them. Mr. Fernow concluded with the hope that there would be no need of inaugurating a government for detached reservations, but that Congress would pass a bill for the withdrawal of all timber-lands from entry and for their general administration, since nothing short of such a measure would satisfy the needs of sound forest-policy.

Correspondence.

Do Varieties Run Out?

To the Editor of GARDEN AND FOREST:

Sir,—I have read with interest Dr. Hoskin's article (see vol. iv., p. 593), but I can hardly endorse his view that the weak varieties may run out even under favorable conditions. The decision of this question seems to hang upon the influence of propagation by different methods. In the economy of nature there are several methods of multiplication, that by seeds being more nearly universal, but I cannot see why it is more natural than increase by runners, as in the case of the Strawberry and some other plants. If we lay aside the great changes

which have occurred in climate and other conditions during the past ages of the world, and which are likely to occur again, I suppose that no one will hold that seedlings of a Chestnut or an Oak or any other tree will have their longevity diminished on account of the old age of the parent tree. What is the ground for supposing that a plant, produced at the end of a runner, is more likely to feel the effect of the wearing out of the original plant than is a seedling?

In the instance of a Strawberry the plant that forms at the end of a runner and roots in the soil is soon capable of sustaining an independent life, as a new edition of the original variety, and ready in turn to throw out another runner for successive editions; and I can see no reason why the plant at the hundredth thousandth remove from the original differs in vigor or longevity from seedlings at a later removal. Some plants increase by throwing up suckers, others from bulbs and rhizomes, others from the tips, and these plants seem to have the same vigor as seedlings. Now, why should multiplication by cuttings or grafting differ in vigor from individuals produced in any other way? The entire practice of horticulture is based on the theory that these cuttings produce new plants, which are essentially individuals, with a life of their own and with no dependence on the parent.

As to the practical bearing of the question Dr. Hoskins says that the Fameuse Apple is not doing as well now around Montreal as it formerly did, and leaves us to infer that this may be the possible result of the running out of a weak variety. It may be that local causes produce the difference, for the Fameuse here is more vigorous, and quite as productive, and gives larger fruit than it did in Massachusetts thirty years ago. The trees standing in nursery-rows show no inherent weakness. Wilson's Albany Seedling Strawberry has often been quoted as an example of running out, but it is still grown in many places, and wherever it is said of the Wilson that "it does not do as well as it used to," there may be sufficient reason for the change. Strawberry rust was unknown in this section a few years ago, and the Wilson is peculiarly liable to its effects. We are, therefore, growing varieties which are less susceptible to injury from this pest. Whenever a fresh importation of plants is made from some distant place where this rust does not prevail they show all their early vigor. On the other hand, the Pearl, which has only been in existence a few years, and which is a vigorous variety under favorable circumstances, rusts so badly that it is a total failure in four cases out of five.

Dr. Hoskins and many others seem to think that a variety with a weak constitution is liable to run out. Of course, if naturally weak, it would be more susceptible to unfavorable conditions, but only so far as these conditions extend, and this is no proof that any given variety has a term of existence, and when the destined time for its death comes that the variety will cease. I have never yet seen any proof that any good variety with sufficient vigor to carry it through a course of propagation up to maturity could not be made to live indefinitely, if the surrounding conditions are in all respects equally good with those under which it was produced.

Hamonton, N. J.

William F. Bassett.

[This is one of the mooted questions in horticulture, but facts which seem to have weight on one side or the other are always interesting. It is argued by some that since every seed has two parents, seedlings are more likely to inherit the power of adapting themselves to a wider range of conditions than plants propagated by other methods. On the contrary, many plants, like Horse Radish and the Banana, have been cultivated for generations without the use of seed.—ED.]

Winter Vegetation on Florida Sand-dunes.

To the Editor of GARDEN AND FOREST:

Sir,—On the sand-dunes at Pablo beach, seventeen miles east of Jacksonville, the Water Oaks and Live Oaks are shrubs of from two to four feet in height, their dark greenness being emphasized and enlivened by the pale and radiantly forked fingers of the omnipresent Saw Palm. Around clumps of these three, Black Nightshade and a Ground Cherry, *Physalis viscosa*, were, with the very common *Heterotheca scabra*, mildly flowering this mid-December day.

Under the Saw Palm's leaves the brown and dead stems of a *Eupatorium* were observed at many points, and where the sun has fairer play a pale, brownish gray *Croton*, *C. maritimum*, a prostrate Rock Rose, *Helianthemum Arenicola*, and an equally low but grayer evening Primrose were evidently

enjoying life. This last is *Oenothera sinuata*, var. *hemifusa*, and here exhibits two shades of hoariness and two pronounced variations in the tooting of its leaves. The little, clinging, short-petioled and pure white-flowered *Oldenlandia rotundifolia* seemed to be making an heroic effort to save the sand-hills from removal by the winds of ocean, but the size of its spread seemed hardly likely to give its scheme any large measure of success. It surprised me to find this diminutive plant so high on the dunes in soil apparently so dry. Upon these same inclined and shifting surfaces a spreading composite, supposed to be of rather recent introduction, occurs frequently. This is *Acanthospermum xanthoides*, with heads which, when their fruit is mature, resemble minute, especially crabbed specimens of the five-rayed star-fish. This was in flower, as was also another equally modest member of the same order, *Eclipta erecta*. With the *Eclipta* were the strict-stemmed and blooming *Samolus floribundus*, the prostrate and also blooming *Herpestis Monniera*, and the creeping *Lippia nodiflora*, not yet showing its heads of flowers.

The *Lippia* and *Herpestis* had dipped into the white-lined, quietly flowing sulphur-water brooklet, while following them and holding above their stems its peltate leaves appeared the umbelled marsh Pennywort, *Hydrocotyle umbellata*, as careless of the season set by the manual for exhibiting its flowers as many another of the lower-growing species. I brought away with me the dead calyx-decorated stems of *Teucrium Canadense*, but had rather have secured a single stem of the Youpon, densely set with drupes, than aught else. This seaside Holly covered perhaps more space than any other one plant growing back of the dunes, but it lacked just here its handsome red berries, not a simple specimen in fruit being seen by me during my several hours' stay.

Jacksonville, Fla.

B. F. Leeds.

Recent Publications.

Japanese Art in the Arrangement of Flowers.—I.

The Flowers of Japan and the Art of Floral Arrangement. By Josiah Conder, F.B.I.B.A., Professor of Architecture and Architect to the Imperial Japanese Government. With illustrations by Japanese artists. Tokio, 1891.

This most beautiful, most novel and interesting book is of quarto size, and is illustrated by fourteen full-page plates in color and forty in black and white, as well as by many cuts in the text. It is handsomely printed and is charmingly bound in parchment covers decorated in color. All the drawings, which include landscape and garden views with figures, are excellent examples of Japanese draughtsmanship and printing, and no more need be said to prove their excellence. There is only one fault in the make-up of this admirable volume: the silk strings which bind the sheets together are inserted so close to the edge of the text that it is difficult to open the pages wide enough for perusal.

In his preface Mr. Conder says that his book is the result of the interest excited by a paper on the subject which, in 1889, he published in the *Transactions of the Asiatic Society of Japan*. He has now supplied a much larger amount of information, which gets triple value from its profuse illustration, but has cast it in a simpler shape. The subject is so unfamiliar to most readers and Mr. Conder's treatment seems so detailed to western minds that it is impossible to review the book in any limited space. Every chapter is significant; almost every paragraph is suggestive; and an attempt to mark passages for quotation would leave no stretch of margin untouched. Of course, some of the facts which Mr. Conder makes plain have been noted in a more or less casual way by a hundred travelers in Japan. But none of them, perhaps, has ever before been so clearly set forth, and nothing previously published in our language approaches this book in its explanation and illustration of the whole fascinating and complicated subject; but how complicated, how subtle, emblematic, poetic, religious, and even philosophic and historic, are the ideas with which it is inseparably connected in the Japanese mind, one would never fancy until he has had Mr. Conder for his guide.

Mr. Conder makes no attempt, he tells us, "to discuss the different schools of flower-design, each of which lays claim to be the only true exponent of the art, and to possess secrets unknown to rival teachers. A study of the different theories of these schools, and of designs illustrated in their published works, shows that the principles of arrangement followed deviate in no important points." Three chapters are devoted to the flowers of the country, classified as those of spring, of summer and of autumn. In the first we read of Plum-blossoms

and Cherry-blossoms—of the various ways in which they are cultivated and are enjoyed. The second tells us about the Wistaria, the Iris, the Pæony and the Lotus; and the third about Chrysanthemums, Maples and the "seven plants of autumn," by which term are meant the *Lespedza*, the *Morning-glory*, the *Eulalia Japonica*, the *Valeriana villosa*, the *Valeriana officinalis*, the *Pueraria Thunbergiana* and the *Carnation*. These, we are told, though comparatively ineffective individually, are prized at a season when flowers are rare, and gather "importance and interest in combination." But much the larger part of Mr. Conder's book is absorbed by the eight chapters on Floral Arrangement devoted to Flowers According to their Months, History and Theory, Lineal Distribution, Selection of Material, Flower Vessels, Position of Flowers in Rooms, Ceremonial and Etiquette, and Practical Examples.

"The arrangement of cut-flowers in vessels of various kinds," says the author in an introductory passage, "has become with the Japanese a decorative art of considerable refinement, compared with which the western methods of floral composition appear but haphazard combinations. The bouquet, the wreath and the garland, all depending for their beauty upon the close massing of blossoms and greenery in luxurious confusion, bear no resemblance whatever to the more austere and open combinations of the Japanese. The fact that many of the most charming flowers of the country are those of trees, the blossom-clad twigs of which it is impossible to arrange in closed and rounded masses, may in some manner explain the open, lineal character given to floral designs; but the same treatment is applied equally to flowering plants and grasses which lend themselves more easily to the European method of grouping. The peculiarity of treatment noticeable in these flower-arrangements, is closely connected with the Japanese manner of observing and enjoying floral nature. Whereas the eastern amateur devotes his attention mainly to the blossoms, the Japanese lover of flowers bestows his admiration on the whole character of the plant or tree producing them. The rugged nature of the Plum trunk, with its straight, stiff shoots, or the graceful sweep of the branches of the Weeping Cherry, are inseparably associated with the beauty which the blossoms themselves possess. The lines of branch and stem, the form and surfaces of leaves, and the distribution of buds and blossoms, all receive their full share of attention. The loveliest buds and blossoms torn from their stems and crushed together in a mass, with ferns or other greenery between them, convey to the Japanese mind no idea of floral art or beauty. The art under consideration is, in fact, based upon the representation, more or less conventional, of floral growth; and principally for this reason the compositions are made to assume an open character, in which the individual forms of branches, stems, leaves and flowers are all clearly expressed. The Japanese term 'Hana,' translated as flower, has, in the art of floral arrangements, a much wider signification than its English equivalent. Among the so-called Flowers of the Season are included certain evergreens and other flowerless shrubs and trees, some of which hold very high floral rank. The Pine and Bamboo, for example, both occupy a very important place in what are called Flower-arrangements. And the Maple, with its reddening leaves, is used as one of the principal flowers of autumn.

"Seasonableness in the choice of material is one of the leading principles which guide the designer. The luxurious taste for designs, as associated with the idea of rarity, is diametrically opposed to the rules of the art under consideration. Flowers blooming out of their proper season are, with very few exceptions, rejected for floral compositions, which are intended, in a manner, to be expressive of the particular period of the year. April blossoms used in any other month would appear to the flower artist as incongruous and out of place as would be winter clothing worn in summer-time. It therefore naturally follows that a proper cultivation of the Floral Art requires a thorough acquaintance with the nature and growth of all trees and plants employed; and even a close observation of the varying characteristics of the same plant during different seasons, in the case of those which are common to several months. The Flag, or Iris, for example, which is common alike to certain months of spring, summer and autumn, has a peculiar bend and vitality in its leaves, and a different length and vigor in its flower-stems, at the various periods of its growth; these distinctions are all kept in view when employing this flower in compositions."

To explain what the Japanese artist has to learn before he can begin to practice the art of flower-arrangements, Mr. Conder then gives long lists of the plants appropriate to the

different months of the year, and notes those which are suitable for felicitous occasions and those which, on the other hand, are called "ominous."

"Considerations of good or evil luck," he says, "enter largely into the choice of flowers for floral arrangements, especially when employed as decorations for occasions of rejoicing." Those which are reputed to possess poisonous properties, even if this be in their roots alone, are objected to at any time, and all flowers having a strong odor are considered unsuitable for placing before guests, a fact which certainly seems strange to the western mind. The Japanese, it may be said, do not feel as we do that the odor of a flower adds to its attractions from the point of view of sentiment. Mr. Conder then shows that the art of floral composition consists of combinations of two or more kinds of growth, and that in these combinations, not only as regards the actual manner of grouping, but also as regards the preliminary question of selection, the Japanese artist is guided by rules which to us seem curiously arbitrary and subtle. The fact that two flowers grow together at the same period of the year by no means justifies their being placed together. "Sometimes," says Mr. Conder, "too close a resemblance in form or color is the reason of the objection; in other cases, similarity of species, or of locality of production, leading to redundancy of expression in the composition, is the cause of the dislike. The Peach and the Cherry, for example, being both flowering trees and somewhat similar in character are not considered suitable in combination."

We cannot follow the author through his most interesting chapter, called "History and Theory," where he examines into the origin of the now complex art of floral arrangement, and the myriad meanings which the Japanese read into their arrangements. In beginning his detailed analysis of Japanese flower-arrangements he speaks first of "Lineal Distribution." "The lines or directions," he says, "taken by the different stems or branches form the basis of all compositions. . . . The treatment followed may be likened somewhat to the methods employed of distributing carved foliage in architectural panels. The surface of the water in which the flowers are placed is technically considered to be the soil from which the floral growth springs, and the designer must here convey the impression of stability and strength. However good the upper lines of the composition may be, a weak springing at the base deprives it of life and vigor; for it must be remembered that not flowers alone, but floral growth and vitality, are to be expressed in the designs. . . . In the distribution of the principal lines of the composition from the point of their separation, the artist studiously avoids an equal-sided or symmetrical arrangement, but he obtains a balance of a more subtle kind, which is at the same time productive of a pleasing variety of form. Balance and harmony without repetition is a governing principle in this as well as in other Japanese arts." Many pages of careful description and many outline cuts then explain the careful way in which the Japanese arranges his main stems in a flower-group, the arrangement being sometimes bilineal, sometimes tri-lineal and sometimes five or seven-lined by the addition of subordinate lines to a tri-lineal arrangement. Each of these schemes may be infinitely varied, but stems are never grouped together in a careless manner irrespective of an underlying lineal idea. Most arrangements are designed principally to be seen from a point of view immediately in front, yet, we are told, they are not the flat arrangements which might at first sight be supposed from explanatory drawings, especially in the more complex compositions; a pleasing variety is given at the back and sides as well, and their effect, when regarded from these points, is to some degree taken into consideration.

"Certain errors," says Mr. Conder, "in arranging the lines of floral designs, are pointed out to be strictly avoided. Some of these are called Cross-cutting, View-cutting, Window-cutting, Lattice-cutting and Parallelism, which names sufficiently indicate the effects produced, and the reasons why they are to be condemned. In many compositions one of the principal lines is allowed to droop conspicuously at one side, and is called a Streamer; but it is a fatal error to use a Double Streamer—that is, to insert a drooping branch on each side of the same composition."

Bulletin 34 from the horticultural division of the Cornell University Experiment Station is devoted to the Dewberries, several varieties of which have within late years come into prominence. Since the histories of fruits are soon lost and definite knowledge of their methods of variation and degrees of improvement become impossible, we are glad that a record of this fruit should be made thus early in the history of its

cultivation, and we agree with Professor Bailey that it is a great misfortune that we cannot refer to similar reports on other native fruits, such as Blackberries, Raspberries and Grapes. In common speech, the word Dewberry is applied to any creeping Blackberry, but the true Dewberries are distinguished from the Blackberries not only by their trailing habit, but particularly by their inflorescence, which is cymose, the centre flower opening first, and the flowers few and scattered. In the Blackberries, on the contrary, the clusters are essentially corymbose or racemose, the lower and outer flowers generally opening first and the flowers carried in dense clusters. Another difference is, that the Dewberries are propagated from tips, while the Blackberries propagate by suckers.

Dewberries, as cultivated, represent two distinct species of the Bramble or *Rubus*, the first of which is the northern Dewberry (*Rubus Canadensis*), to which type belong the varieties known as Windom, Lucretia's Sister and Geer. Under this species are two sub-types, to one of which belongs the Lucretia, botanically recognized as variety *roribaccus*, and to the other sub-type, the variety *invisus*, belongs the Bartel or Mammoth, General Grant and Never Fail. The second species is the southern Dewberry (*Rubus trivalis*), to which belong Fairfax, Manatee, Bauer and Wilson's White. Since these species are quite distinct, it is reasonable to infer that different management should be used in the different classes, or, at least, that various results will be obtained from their cultivation.

Professor Bailey adduces a large mass of testimony from various sources, which brings out the peculiar merits of the Dewberries as cultivated fruits as well as their peculiar demerits. Their good points are earliness, large size, attractive appearance and the ease with which they can be protected in winter. Their quality is a matter of question. In some places, and to some tastes, they are delicious, rich and spicy, while other judges call them flat and flavorless. The disadvantages in the cultivation of Dewberries are the failure of the flowers to set, the formation of nubbins, or imperfect fruit, and the difficulty of picking the fruit. There is reason to believe that pruning and thinning the canes would tend to obviate the first two difficulties and to make the plants productive, but this is not known positively. The labor and unpleasantness of picking may be avoided by training the plants on a rack or trellis, and by keeping them well pruned.

The plants are generally set about the same distance apart as Blackberries—that is, in rows seven feet apart and three or four feet apart in the row, and the canes are allowed to lie on the ground, and are headed in when they reach about three feet in length. A mulch of straw beneath the canes keeps the berries clean and renders picking pleasanter. A wire trellis, like a Grape-trellis, or various kinds of racks may be used, upon which fruiting canes can be tied, and for amateur cultivation, at least, some such upright training seems to be advisable. Only four to six fruiting canes should be allowed on one plant. Some varieties, particularly the Windom and Bartel, appear to do best when the fruit is shaded.

Twelve varieties of Dewberry have been named and more or less disseminated during the last twenty years. Of these, four (omitting the Mammoth) have gained more or less prominence, and are found to possess decided merits in certain places. This is a fair proportion of good varieties to inferior ones, as indicated by the annals of other fruits. Many persons have found the cultivation of this berry profitable, and this is evidence that the fruit is an acquisition. But it has not yet found general favor, and it is hardly probable that it will ever become a rival to the Blackberry in popularity.

The varieties which enjoy most prominence are Windom, Lucretia, Bartel and Manatee. The Windom possesses promise for the north-west, of which it is a native. It has not yet been tested to any extent elsewhere. It appears to demand partial shade for the best success. The Lucretia has been found to be a desirable and profitable fruit in many places over a large extent of territory, and it is therefore safe to conclude that its range of adaptation is large. Many, however, have failed with it. It appears to be variable, and many of the plants are worthless. It is seriously attacked by anthracnose and by a Bramble rust. Bartel has found great favor with some growers in the west, from Wisconsin to Nebraska (see GARDEN AND FOREST, vol. iii., p. 373, and vol. iv., p. 19, where the plant is figured). It has not succeeded well in the east so far. Some of the variety known as Mammoth appears to be identical with Bartel. Manatee is probably valuable for the south, and it appears to be the most useful form of *Rubus trivalis* yet tested. There are varieties of the southern plant with white berries, for which special merits are claimed.

Notes.

Carnations during the holidays brought from \$2.50 to \$4.00 a hundred, and at these prices the markets took everything that was offered.

We have often spoken of the increasing popularity of Tuberous Begonias in this country, and some photographs just received from the Messrs. John Laing & Son show fields of the single varieties which contain as many as 250,000 plants. We should hardly have expected ten years ago that these plants would soon be grown by the acre in open fields on both sides of the Atlantic.

Some of the poetical names applied by the Japanese to their Chrysanthemums are The Border of the Thin Mist, Companion of the Moon, Shades of the Evening Sun, Beacon Light, Waves in the Morning Sun, The Sky at Dawn, First Snow, Disheveled Hair in Morning Sleep, Star-light Night, Sunny Morning, Leaves and Frost, Golden Dew, Moon-lit Waves and Moon's Halo. This last name we should hardly expect to find applied to a flower of an orange-red color.

The thirty-seventh annual meeting of the New York Horticultural Society will open at Rochester on Wednesday, January 27th, and continue two days. We are acquainted with no similar association in the country where the discussions, especially those on fruit-culture, are uniformly of such a high character. The programme provided for this year is one of wide and varied interest, and the essayists who have been secured are men of the highest rank in scientific and practical attainment.

Among the resolutions passed at the late meeting of the American Forestry Association was one urging upon superintendents of schools in the various states to require that the high schools shall make forestry, in connection with botany, a subject of instruction, and it was further resolved that whereas the interests of agriculture are intimately dependent upon proper forest-conditions, and whereas the Government of the United States has lately made large additional appropriations to agricultural colleges and experiment stations, it is therefore earnestly recommended that forestry be made a part of the curriculum in the agricultural colleges and experiment work in the various stations.

The Albemarle Pippin, which many people consider the best dessert apple, apparently cannot be bought in the markets of any American city, and Americans who want to enjoy this product of the Virginia and Carolina foot-hills must go to London to find it. American Pippins are displayed there in the show-windows of all the principal West End fruiterers; and, like all fruit in London, bring high prices, four shillings the dozen being asked for them last month in the stalls in Covent Garden Market. It is suggested to the growers that it might prove profitable to give Americans an opportunity to purchase this fruit in their own markets. Americans are always willing to pay for superior quality, and those who have not eaten a Virginia Pippin at its best have only a restricted idea of how good an apple can be.

A correspondent of an English paper speaks with enthusiasm of the Christmas Roses at Warwick, where, in one mass, a broad expanse of snowy bloom compelled an expression of admiration. The effect was produced by three hundred clumps of the variety Major of Helleborus niger, all studded with flowers as closely as they could be packed. The blooms were large and beautifully fresh and clean. It is the practice here to grow the plants in a north border, where they remain two, and sometimes three, years. About three weeks or a month before they are wanted in flower the plants are lifted with good balls of earth and placed closely together on the floor of a vinery or other cool structure. A little soil is worked around the roots as the work goes on, and when completed the whole mass is watered through a coarse rose. This washes the soil down among the roots, and leaves the flower-buds clean. As the buds begin to open a little heat is given to lengthen out the flower-stems, as they are better for decorative work when the stems are of good length. After flowering the plants are hardened off, divided, and again planted in the open air.

Death has recently made serious gaps in the ranks of the men who have shed lustre on French horticulture in recent years. At Passy, on the 6th of December, Alphand, the engineer of the city of Paris, died rather suddenly, in his seventy-fourth year. His career commenced at Bordeaux, in 1837, as a civil engineer; here he attracted the attention of Haussmann, who, when in 1874 he became Prefect of the Seine, im-

ported him to Paris to carry out the emperor's plans for the transformation of Paris. He organized the system of street-planting, which has done so much for Paris, and directed the completion of the Bois de Boulogne, constructed the Bois de Vincennes—the people's park of Paris—the Park Monceau and the Park of the Buttes Chaumont, all the squares and promenades of new Paris, and the gardens and greenhouses of la Muette, where the plants used for the decoration of the municipal gardens and buildings and squares are grown, perhaps the best-equipped plant-factory in the world. The success of the great Exposition of 1889 was largely due to the knowledge, taste and marvelous powers of organization of Monsieur Alphand. He made the plan for the grouping of the buildings and the arrangement of the ground, and personally directed all matters of construction and the arrangement of the exhibits. He had brought to this herculean task the experience gained in the organization of two earlier Universal Exhibitions, and the co-operation of a perfectly trained and enthusiastic staff; and yet, with all his exceptional advantages, the apparent ease with which Alphand handled the resources placed at his disposal was marvelous even to those persons most familiar with the perfection of French organization. Under the title of *Les Promenades de Paris*, Monsieur Alphand, many years ago, published a folio volume, splendidly illustrated, in which are described the public works of Paris executed under his direction. Portions of this book, with lists of the trees and shrubs cultivated in the gardens of the city of Paris, were afterward published by Alphand and the Baron Ernouf in a book called *L'Art des Jardins*.

The death of the great engineer was preceded by a few days only by that of Auguste Hardy, the head of the School of Horticulture at Versailles, who, if less known to the general public, was hardly less distinguished in his particular sphere than Alphand was in the larger theatre of his labors. In the interesting and sympathetic sketch of his friend, which Monsieur André has lately printed in the *Revue Horticole*, it is interesting to read that Auguste Hardy's love of horticulture belonged to him by right. His great-great-uncle, named Christophe Hervey, was at the head of the Pépinières des Chartroux at the Luxembourg, from 1752 to 1796. The son of this Hervey was in 1809 entrusted by Chaptal with the duty of re-organizing these nurseries; and a few years later he recommenced in the Luxembourg Gardens the courses of lectures upon the care and pruning of fruit-trees which the Revolution had interrupted. The younger Hervey was succeeded in 1817 in the management of the Luxembourg gardens by Alexandre Hardy, the father of Auguste Hardy, who, naturally enough, determined at an early age to devote his life to horticulture. He became director of the vegetable-garden connected with the palace at Versailles, which he soon made a model of their kind; and when, in 1873, these gardens were converted into the National School of Horticulture, he was selected as the head of the new institution, which has gradually grown and improved under his able management until it has become the best school of its sort in the world. As first vice-president of the National Horticultural Society, Monsieur Hardy was for years the head and moving spirit of that body, and was enabled to render immense services to French horticulture. No man in France appears to have been more loved and honored by his associates, and the influence of his teachings and of a rare and delightful personality was felt far beyond the limits of France through the pupils who had been instructed and trained by him.

As this paper goes to press we learn with regret that Mr. James Taplin, well known as a grower of choice and rare plants, died on Saturday at his home in Maywood, New Jersey. Mr. Taplin commanded respect for his skill in the branches of horticulture to which his life was devoted and for the straightforward manliness of his character. He was in his sixty-first year.

Catalogues Received.

JOHN LEWIS CHILDS, Floral Park, Queens Co., N. Y.; Seeds, Bulbs and Plants, of New, Rare and Beautiful Flowers; Agricultural Seeds.—GEORGE HANCOCK, Grand Haven, Mich.; New and Standard Carnations.—PETER HENDERSON & Co., 35 and 37 Cortlandt Street, New York, N. Y.; "Everything for the Garden."—E. H. KRELAGE & SON, Harlem, Holland; Double Herbaceous Chinese Pæonies.—NATIONAL HOT WATER HEATER CO., New York, N. Y.; The Spence Hot Water Heater, for Dwellings, Greenhouses, etc.—J. M. THORBURN & Co., 15 John Street, New York, N. Y.; Flower, Vegetable and Grass Seeds; Tree and Shrub Seeds.—JAMES VEITCH & SONS, King's Road, Chelsea, London, S. W., England; Garden and Flower Seeds for 1892; Horticultural Implements.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLES:—More Forest-reservations.....	25
An Appropriate Decoration. (With figure).....	26
The Jubilee Year of Kew Gardens.....	26
New England Parks.....	Mrs. J. H. Robbins. 27
The Perforation of Flowers. (With figure).....	J. G. Jack. 29
FOREIGN CORRESPONDENCE:—New Garden-plants of 1891.—I.....	W. Watson. 30
CULTURAL DEPARTMENT:—Seed-sowing.....	O. O. 31
Notes from the Harvard Botanic Garden.....	M. Barker. 31
The Experiment Garden.....	E. P. Powell. 33
Autumn Snowdrops.....	J. N. G. 33
Tomatoes, Early Cabbages.....	Professor W. F. Massey. 33
THE FOREST:—The Forestry Movement in the United States... J. D. W. French.	34
CORRESPONDENCE:—Eckford's Sweet Peas.....	W. T. Hutchins. 34
RECENT PUBLICATIONS:—Japanese Art in the Arrangement of Flowers.—II.....	35
NOTES.....	36
ILLUSTRATIONS:—The Perforation of Flowers, Fig. 7.....	29
An illustration of the use of Herbaceous Plants in connection with build- ings, Fig. 8.....	32

More Forest-reservations.

THE authority to set apart forest-lands as permanent reservations with which the President of the United States was endowed less than a year ago, enjoins upon him the duty of selecting portions of the national domain where it is most desirable to retain the forest-cover. There can be no question, therefore, that he will welcome any suggestions from well-informed and public-spirited citizens in regard to tracts of forest whose preservation may seem most essential to the general welfare. We spoke of it as a gratifying fact in the early autumn of last year that a memorial naming and describing at length five sections which seem suitable for public reservations had been presented to the President by persons of well-known scientific and practical attainments. We gave the descriptions of some of these tracts, with the reasons offered for selecting them. The first was the Flat Head and Marias River Reservation, originally proposed in a bill by Senator Edmunds some eight years ago. The second was the Tulare Reservation, which, like the first, covered an area of 7,000 square miles. It lies on the western slope of the Sierra, and includes the eastern watershed of the San Joaquin River and the streams which flow into Tulare Lake. It was asked for by the California Academy of Science and a convention of the citizens of four of the counties of that state. The Pecos River Reservation, advocated by the Surveyor-General of New Mexico and many other citizens, is on the Las Vegas and Santa Fé ranges. Pike's Peak and its slopes, including an area of some 350 square miles, was the next reservation asked for in order to preserve from extinction the forest-area which now furnishes timber and fuel for 30,000 people, and the water indispensable for irrigating hundreds of thousands of acres of land, besides supplying many communities in a place where the husbanding of water is a trying necessity. The proposed Minnesota Reservation covers some 6,000,000 acres, and includes the sources of the Mississippi and the Red River of the North.

The President has already enlarged the boundaries of the Yellowstone, and has established the White River Reservation in Colorado, with an area of 2,000 square miles. Special agents, too, have been detailed by the Secretary of the Interior to make examinations of the other tracts and report upon their suitability for the purpose indicated. There seems to be a reasonable probability that in some of these cases the President will exercise his power, although to some of them opposition has been made by interested persons. This is especially true of the Minnesota tract; but there can be little doubt that the public opinion of the state would strongly favor the reservation if it was understood that no agricultural land is to be withheld from settlers, and that the people are not to be deprived of the products of the forest. On the contrary, the forest is to be saved from wasting fire and held to furnish continuous supplies under economical management, instead of being stripped at once of its valuable timber and left to be burned over and abandoned.

Another reservation to which we have not before referred at length is asked for by many citizens of North Dakota, including the Superintendent of Irrigation and Forestry. It embraces the elevated lands in Butte and Renville counties, known as the Turtle Mountains and adjacent to the Canadian boundary. This tract consists of a plateau several hundred feet above the surrounding plains, cut near its edges by deep coulees and rising in irregular mountains at their highest point to 2,500 feet above the sea-level. On the borders of this tract are numerous springs, the fountains of streams which water the plains; and many lakes are found in the centre of the tract. Most of it is covered by a mixed growth of Oak, Ash, Elm, Cottonwood, Box Elder, Willow and other trees; but owing to the fires which run through it and the indiscriminate cutting, the forest is in very imperfect condition. It is asked that what remains of this forest may be preserved in order to furnish perpetually wood-products for the surrounding treeless region; to furnish seedlings for tree-planting in the prairies; to retard the melting of the snow and water, and thus prevent spring freshets on the plain; to sustain a water-supply during summer, and to form a protection against the cold winds of the north and the drying winds of the west. It is the only wooded area of any extent in that country which remains in the hands of the Government, and it would be of priceless value as a place of recreation for the people of the neighboring plains and adjacent towns and cities.

At the recent Forestry meeting, among other reservations asked for was one known as "Lost Park." It was advocated by Colonel Ensign, Forest Commissioner of Colorado, and many of the leading citizens of that state. It is in central Colorado, some forty miles south-west of Denver, and forms a part of the water-shed of the South Platte River. It includes about 500 square miles, and ranges from 6,000 to 12,400 feet in altitude above the sea. It is a mountain-region with small valleys, some of the ranges being rugged and precipitous and rising occasionally above the timber-line. The northern slopes of the mountains are generally wooded, and there are small areas of merchantable timber standing there, while the southern slopes are usually devoid of tree-growth. No minerals of any value are known to be within its boundaries. A few entries have been made within the tract, some small saw-mills built, and some cutting has been done for charcoal and other purposes. The settlements along the streams which flow out of the tract need all the water for irrigation that can possibly be secured, and if the timber can be guarded from fire for some years the northern slope will speedily be re clothed with forest.

The Crater Lake Reservation is on the Cascade Mountains, in south-west Oregon, about the source of the Umpqua, Rogue, Klamath and Des Chutes rivers. The whole area to be preserved is 360 square miles. It ranges in height from 4,000 to 9,000 feet above the sea, and includes several lakes at an altitude of 7,000 feet. An extinct vol-

cano, the crater of which is now occupied by a beautiful lake, gives the name to the reservation. Most of the tract is timbered, some of it densely, but on account of frequent fires much of the young growth has been destroyed and it is threatened with speedy denudation. If fire and flocks were excluded the young growth would soon afford a dense shade for the conservation of snow and moisture. The deep snow-falls of winter linger in banks late into the summer, and waters from these melting drifts form the streams which flow in all directions from the region. Senator Dolph introduced a bill for the reservation of this tract in 1889, and his project is endorsed by many of the prominent citizens of Oregon.

There is little danger that the President will be too liberal in the exercise of his power to set apart reservations, and we have to confess the fact that after they are set apart there is no way of defending them from invasion. Mr. Fernow has suggested a plan for their management, and although past experience does not encourage the belief that any such elaborate system will be speedily adopted by Congress, still it is the duty of all who are interested in these matters to work as if all things were possible and to trust in the growing enlightenment of the people of the country on this important subject. We may be nearer a rational forest-policy than we know, but until such a policy is inaugurated it is worth while to take advantage of every possible means to make the best of the situation. Mr. French, in the address from which we quote elsewhere, suggests that a school of forestry be established at West Point, so that officers of the army shall be instructed in as much of the science as is needed to make them competent managers of these reservations. But even without such a school it is to the army that we turn for the protection of public property. Detachments have already been employed in protecting the Yellowstone and the Big Trees. This is the one constabulary force in the country which is thoroughly organized, which has esprit de corps, which is free from political influence, and to which we can look for the courage and trained ability to enforce obedience. It is certainly worth while to consider whether the army is not altogether the best means at hand, not only for the immediate protection of these reservations, but for policing all the public forests of the country until some permanent forest-policy is established.

An Appropriate Decoration.

THE plant of *Helianthus orgyalis*, growing against the wall of a house, as represented in the accompanying figure (page 32), is a charming example of the pleasing effect produced by placing herbage directly in contact with a building to link it to the ground.

This tall Sunflower, with its lanceolate leaves and small single blossoms, has a habit of growth that makes it singularly appropriate and agreeable in such a situation, and the lateness of its blossoming makes it a delightful adjunct to a house in autumn, when earlier flowers have perished. The dwelling in the figure is a long, low building, constructed of white plaster below, and of weather-darkened shingles above. Everywhere it is tied to the broad green lawn from which it springs by ropes and garlands of vines, which climb above the roof of the one-storied studio at one end, and drape the supports of a veranda at the other, in a way which makes the house grow as naturally from the velvet turf as a tree or shrub.

Ivy and Virginia Creeper, the small-leaved flowering Grape, and other graceful climbers weave over the building a drapery of foliage that flows in charming curves to the ground, and adds to the picturesqueness of the whole construction, which in itself has an air of shelter and sweet home-likeness that make one eager to enter its arched doorways, or to linger under the roof of the wide outdoor room, with its mosaic floor and vine-wreathed supports, which forms so agreeable a feature of the dwelling.

Branching overhead are stately Maples, and from be-

tween their straight trunks and low-growing foliage are beautiful glimpses of a bay, with boats and islands, and a stretch of Beverly shore. In the distance, across the lawn, one catches sight of another white villa with patio and balcony, supported by Moorish arches like a home in Spain.

The little Sunflowers by the window, with their lance-like leaves and golden shields, stand like gallant sentinels, ready to protect the household. The rough surface of the plaster bears soft, waving shadows on its snowy surface, and throws the foliage into high-relief. More shadows are thrown by the overhanging eaves over which the blossoms tower, nodding gallantly in the wind, while some of them shine under the gutters, or peep in at the windows, where the irregular panes are set in leaden curves, representing the shape of the Fire Lily, the totem of this artistic home. On the opposite front of the house is the entrance, where on either side and above the shadowy door-way are bas-reliefs modeled in the plaster, some of them representing the same Lily in majestic hues. Here against a curve of the white wall shine the glossy leaves of an Orange-tree, laden with its golden fruit, again suggestive of summer climes, and softer skies than these.

Thus, by vine and herbage, flower and fruit, the dwelling is made to seem a growth rather than a construction, and the value of such connection of house and land is made emphatic. By such means hardness of contrast is banished, and sharpness of outline toned into agreeable mystery, and true picturesque effect obtained.

To produce this unity should be the effort of every one who has even a few feet of land around his dwelling available for planting green things to cling about the foundations, and mask their rigid lines from view. Vines and plants for summer, low-growing evergreens for winter effect, are all beautiful and appropriate, and their use should never be neglected by those who would make their homes attractive and graceful at all seasons.

The Jubilee Year of Kew Gardens.

THE first number of the *Gardeners' Chronicle* for 1892 contains an article on the Royal Gardens at Kew, which have just entered upon their second half-century of useful life. After noting with justifiable self-gratulation that Dr. Lindley, the first editor of the paper, and Sir Joseph Paxton, one of its founders, were largely instrumental in the reorganization of the gardens, the article gives an instructive account of the character of the work of this great establishment. Just now, when an effort is being made to secure a botanic garden for this city, the subject has a special interest for American readers, who ought to have clear ideas about the scope of such an establishment and of the experience and attainments which must be possessed by its directors if it attains anything like a reasonable measure of success. We therefore reproduce the greater part of the article below:

Lindley, in his report to the Government of the day in 1838, said: "A national garden ought to be the centre round which all minor establishments of the same nature should be arranged; they should all be under the control of the chief of that garden, acting in concert with him, and through him with one another, reporting constantly their proceedings, explaining their wants, receiving their supplies, and aiding the mother country in everything that is useful in the vegetable kingdom. Medicine, commerce, agriculture, horticulture, and many valuable branches of manufacture would derive benefit from the adoption of such a system. From a garden of this kind Government would be able to obtain authentic and official information on points connected with the founding of new colonies; it would afford the plants there required without its being necessary, as now, to apply to the officers of private establishments for advice and assistance."

Sir W. Hooker's appointment dated from April 1st, 1841. By his energy, knowledge and courtesy he speedily effected much-needed reforms. His large correspondence with all quarters of the globe, and which had been formerly turned to good account when in Glasgow, were even more fruitful at Kew. On August 9th, 1841, the sub-editor of this journal visited

the garden, and in his remarks at p. 535 of our volume for that year it is recorded that persons, provided they did not touch the plants, were permitted to walk through the grounds without attendance! that there had been a large increase of "respectable company," and that neither plants nor flowers had been injured by the visitors.

Other details are given as to the changes in progress, and especially as to the unrivaled collection of *Proteaceæ*, a group of plants, by the way, better represented fifty years ago than now. The changes effected by Sir W. Hooker were again adverted to at p. 123 of our volume for 1842, where it is recorded that "the well-directed energy of Sir W. Hooker, assisted by a judicious liberality on the part of the Commissioners of Woods and Forests, will speedily place Kew where it ought to be, and once was—at the head of the botanical establishments of Europe."

It is not our intention on this occasion to advert in detail to the further progress of Kew, its great extension, the gradual improvements in general cultivation, and in all departments, under the direction of Sir William Hooker and of Sir Joseph Hooker, and latterly of Mr. Thiselton-Dyer; the new houses constructed, the museums built, the herbaria and libraries formed, the laboratory and picture-gallery established; nor need we do more in passing than allude to the extraordinary literary and scientific activity evinced in the numerous substantial volumes that have emanated from Kew. The Colonial Floras, for instance, were projected by Sir William Hooker. Some are completed, others, like the tropical and extra-tropical African floras, will, we trust, speedily be resumed; while the unrivaled experience and the undaunted energy of Sir Joseph Hooker have brought the Flora of British India nearly to completion.

To the general public Kew is a pleasure-garden merely. It is that, of course; but it is far more. It is, and has been for half a century, what Lindley wished it to be, the centre of botanical activity—activity not only in purely scientific botany, but in garden-botany in particular. It has been a main agency in the collection and diffusion of knowledge of all kinds relating to botany, and has ensured the cultivation and dispersal of economic plants of all kinds in our colonies. We have often had occasion to record, with patriotic pride, the great things for humanity which have been effected through the medium of Kew. Commercial men and practical statesmen are not very likely to feel much enthusiasm about botany as a science—they look upon it, if at all, as a harmless pastime; but when they see—as they may at Kew—what it is capable of and what it has done for the benefit of mankind, they naturally look upon the garden as an institution worthy of their support. The cultivation of Cinchona, Tea, India-rubber, Liberian Coffee, represents only a few of the industries which have been established and fostered in India and our colonies chiefly through the agency of Kew.

All that has been done at Kew in the way of gardening, systematic study, physiology or economic botany, has been done in accordance with the letter and the spirit of the recommendations made by Lindley, but modified and extended by successive directors; and the latest advances—that of federating the several colonial botanic gardens, and that of establishing botanical departments in the several presidencies of India and in the colonies—are in strict accordance with the general plan. Kew has thus long been the centre of botanical energy in almost all departments. Its steady progress and its present condition are matters which excite the admiration of the most competent judges. We have lately had an illustration of this in the glowing testimony as to the condition of and the work at Kew afforded to us in conversation with the directors of two of the most important gardens in the world—that of Paris and the Harvard Arboretum.

In some points Kew still needs extension and improvement. The subject of the diseases of plants, for instance, is vast enough and important enough to demand a separate staff of microscopists and entomologists with a small space set apart as an experimental area. The laboratory and library would be invaluable adjuncts to such a department. Systematic and comparative study of the minute anatomy of plants is also a need of the times that might be largely supplied at Kew. Anatomists would not only find there what they want in the way of material, but they might also profit by imitating the systematic orderly procedures and comparative methods of those who devote themselves to herbarium botany, as it is called. The co-operation of the two classes of workers is a thing much to be desired, and we do not know where it could be better carried out than at Kew.

In the garden itself it is recognized that the cultivation, as perfectly as circumstances will allow, of specimens illustrative

of botanical structure and affinities, and of such as are of horticultural and economic importance, is preferable to the accumulation of so-called complete collections of specimens which cannot be properly grown or displayed. Such plants would be more appropriately housed in the herbarium, while their portraits might find a place in the picture-galleries. For strictly horticultural purposes, numerous and varied trials should be made of new plants to ascertain their value; and not only of new plants, but also of some at least of the vast number at present left unutilized by the gardener. Ordinary bedding-stuff cannot, of course, be dispensed with in a public garden; but we do not want to see at Kew what we can see in any of the parks or in the back-garden of any suburban villa residence. What we see at Kew should be—and to a large extent it already is—of educational value as well as agreeable to the eye.

One of the chief wants of Kew at present is suitable provision for plants requiring an intermediate temperature, between that of the stove and that of the ordinary greenhouse or conservatory, one wherein specimens of many of the economic plants of sub-tropical lands may be grown. Much of this kind of material is already to be found in the smaller houses, chiefly in the T-range; but the plants, owing to the smallness of the houses, and to their growth in pots of no great size, do not convey to the minds of those seeking information their true characteristics, and persons interested in commerce go away from their inspection with feelings of disappointment.

By the completion of the temperate-house, the need we have alluded to will be supplied, and space will be found for most of the economic subjects whose cultivation in our colonies and crown-lands is meeting with so much attention. The plants, being planted out in borders instead of cramped and stunted in pots, will attain to fuller development and show their characteristics more perfectly, and for these reasons the enlargement of this house would be altogether an appropriate commemoration of the jubilee year of Kew gardens.

New England Parks.

THE ARNOLD ARBORETUM.

THE Arboretum is not properly a park, according to the commissioners, but as it is a part of the Boston Park system, I take the liberty to treat it as a pleasure-ground rather than as a school of dendrology, for, indeed, information is here administered so delightfully that one is hardly conscious of being at school at all, and gives himself over to the picturesque effects of this tree-garden, which yearly grows more beautiful and attractive.

Those dwellers in Boston who spend their summers in the country and only drive about the environs of their city in spring and fall, hardly get an idea of what the Arboretum is at midsummer, when all its shrubs are in full leaf and blossom, its trees in their best and fullest foliage, and its evergreens showing their finest and most vigorous color, and at any season when people visit it it would be well if they could be made to realize that this beautiful spot is still in its infancy, that it is slowly growing to perfection, and that all that is unfinished and unsightly about it now is but the deep-laid foundation of a great and enduring monument to the generosity of the founders of this wonderful garden, and to the learning and faithfulness and zeal of its Director, Professor Sargent.

The Arnold Arboretum differs from other arboreta, in that it is the largest space in the world devoted to dendrology as a scientific study, and its collection of woody plants is more complete and satisfactory here than in any of the great botanic gardens of Europe, where the tree collections are simply appendages to their very remarkable assemblage of tropical and native plants. Here 150 acres are devoted entirely to the cultivation of woody plants, that is, trees, vines and shrubs; and these are so carefully prepared and selected, and so skillfully cultivated by Mr. Dawson, the superintendent, that better specimens can nowhere be shown of trees that have only been growing for less than a score of years, while the shrubberies are in great perfection and variety, and the vines beautifully luxuriant.

Its scientific value is so well known and is so ably illustrated in this very paper by writers far more able to cope with it on that basis than I, that it is only necessary now to write of it as a place which everybody in its neighborhood ought to be familiar enough with to enjoy as it deserves, and to suggest that when the early spring tempts the city-dweller to prolong his drive that he should view with more than passing attention this unique and valuable possession of Boston, which he is

apt to pass through carelessly, more conscious of the unfinished grounds than of the plans for a great future which have been so carefully considered in the work about him. For here he beholds not the taste of the day and hour, the rendering of a passing fashion in grouping of trees or massing of shrubbery, but a permanent scientific arrangement, at once fine and instructive, which is to be not only for his benefit, but for that of many generations to come, who shall enjoy the full perfection of that of which he receives but a promise.

Through these entrances so strong and simple, where the plain granite gate-posts are just massive enough to be impressive without pretension, he enters one of the great gardens of the world, to be considered by the future American with the same respect with which the Englishman regards Kew, and the Frenchman the Jardin des Plantes.

There are various ways to reach the Arboretum, but to the visitor by rail the Forest Hills Station, on the Boston and Albany Railroad, affords a convenient approach, and by entering at the South Street gate he is introduced at once to the noblest feature of all—the rocky hill covered with noble Hemlocks, which rises on the left of the entrance—while on the right is another elevation, now crowned with a young and vigorous growth of Hickory, planted Pines, Larches and other conifers, that in a hundred years may make it a rival for the opposite hill, which has borne its stately crown of evergreens perhaps for more than a century and a half.

At whatever season one enters this ancient forest it is venerable and impressive. The hill is a wall of rock in broken terraces, and here upon its northern slope the giant trees lift their great shafts and spread their green branches, even as they must have done when Paul Revere was a boy, and British soldiers patrolled the streets of little Tri-Mountain.

There is no level ground except at the very base of the rise, where a stony brook tumbles along beside a narrow foot-path which you cross a plank to reach. In summer the trees afford cool and grateful shade; in winter shelter and warmth, for the winds are baffled by their phalanx of trunks and boughs and foliage, and cannot penetrate the depths of this forest-asylum.

Following the little woodland-path that skirts the hill you emerge finally upon the broad drive-way, to which it runs nearly parallel. This drive-way, admirably graded, leads by a gentle ascent to the higher ground, bordered throughout its large, gracefully sweeping curves by masses of native shrubs, which, either filled with blossoms or fruit, produce all summer the most pleasing effects of color.

Apparently artless in their growth, there is a perfection in the contour of the whole beautiful border, which shows the most careful supervision. Creepers run from the bushes to veil the edges of the road, and the mass behind leads gradually up to the groups of trees, which are arranged in botanical order, but in such natural groups and blending that the beholder does not realize that what he sees is the perfect and thoroughly contrived section of a finished whole.

First, on the right, come the Beeches, with their spreading branches and serrated leaves. Like all the trees in the permanent plantation of this young garden, they have been started here from seed or bud, and, of course, are still comparatively small; but, as they are to endure for a century or two, they are planted at wide distances, so that there will be ample room for the sweep of their great branches. Even now they are beautiful, with their smooth boles and shining leaves, which always seem to catch and reflect more sunlight than those of any other deciduous tree.

Beyond these come the great variety of Oaks, stretching far along the right of the drive-way, while on the left are groups of Hornbeams, rough-barked and gnarled, some of them with hop-like blossoms and leaves like Elms; and then come Chestnuts in variety, and finally a great mass of Hickories of all sorts, between which and the groups of Butternuts and Black Walnuts the road makes a serpentine curve upon itself, and comes gently rising to the summit of the hill, where, from a circular esplanade, there is an extended view of all the surrounding country, with villages and scattered dwellings nestling amid groups of trees, and the far-away towers and spires of Boston, and in another direction the grand outline of the Blue Hills, the whole making a noble outlook full of variety and beauty such as any park might well rejoice in. Here at your feet lie the groups of Birches, Elms and Ash-trees, with Catalpas on a rising ground behind, by which you pass as you wind round the hill on the east side, coming down to the interesting nursery and the great group of systematically arranged shrubs, two miles and a half of them, if you count the length of the walks between the different beds, where they are grouped in splendid luxuriance; such specimens! so vigorous, so handsome, so laden with blossom or fruit according

to the season! It is enough to make the amateur die with envy to see the way they flourish in the rich soil which is supplied to them, where never a weed is permitted apparently to show its intrusive head.

The vines climb upon tall poles and spread out their branches and tendrils until they resemble trees; the Rose-bushes, all single-flowered, bend over with their weight of blossom. The air is fragrant with Honeysuckles and Sweet-brier. The bees make harvest in the warm sunshine and riot amid the wealth of flowers. You forget you are there to learn something, and revel simply in the great luxuriance of this marvelous garden, where are to be seen specimens from all temperate lands grouped and labeled, so that they become an object-lesson of rare beauty. At whatever time of year you go, these beds are gay with flowers or rich with fruits, hanging singly or in clusters from the bending branches. Do you want a shrub for your garden? Here you can see its effect when brilliant with summer bloom, or jeweled with ruby and amethyst fruitage. Does your porch need the shelter of clambering Rose or twining vine? Here you can judge of the proportions to which it will grow under careful nurture. Do your nursery specimens fail to answer your expectations? At the Arboretum you can learn how to help and stimulate their best development.

It will be hard to tear yourself away from the shrubs, and when you have left them behind you resolutely, there are more trees to see, trees cultivated and trees wild, trees that have been pruned and saved from a lingering death, trees that have been grown from seeds sown in the nurseries of this lovingly tended garden. From Magnolia to conifer they run, in all the varying scale of arborescent beauty; and of all the plantations there are none more delightful than the groups of evergreens growing symmetrically on a slope near the Walter Street entrance.

There is a wonderful charm in these groups of Firs and Spruces in endless variety of form and color—stout little Spruces from the Rocky Mountains, the stately fast-growing Douglas Fir, the beautiful Blue Spruce of Colorado, the Black Spruces from Maine, and the White Spruces from Canada, all flourish here, with many other varieties, which are less interesting, botanically, to me than as the most lovely little trees in the world. For in these plantations, only begun seventeen years ago, every tree is vigorously young. They are raised from seed planted in the nurseries here, and are carefully selected for the vigor and beauty of their growth.

The only thing I complain of is that the Arboretum authorities provide the visitor with no place to sit down and enjoy all these wonderful things, among which one wanders until one is weary with pleasure. One would gladly sit for an hour among these winning evergreens until each had become an identity, making little excursions into the mysterious depths of the bosquets and returning to contemplate some especial favorite. The Pines and Larches are equally lovely, but I have a liking for the sturdy Spruces and Firs, wrapped like Esquimaux in their furry tight-fitting garments, sitting down solidly on the ground, with their pyramidal persistence, bidding defiance to wind and weather, and affording alike shelter and satisfaction.

They tell tales of snowy plains and bleak hillsides and far-away peaks, presenting their serried spears to the blast. Their serrated outline against the sky, familiar to me from childhood, is quite other than that of the deciduous trees of southern New England, interspersed as they are with the broad soft masses of Pine-branches. They have an aspect of their own, full of suggestion to the true northerner who has been sheltered by their somewhat austere presence. They partake, too, of the northern character, really valuable and steadfast but not alluring, full of sharp edges and prickly points, and wearing an aggressive air to strangers, with the same power to kindle and burn with a tremendous flame when the occasion comes.

But do not linger too long among the conifers, for there are natural woods to walk in, that have not been planted, with crackling leaves under foot, and underbrush to catch your garments, and glimpses of blue sky through crowding branches, under whose shade young seedlings spring up strong and tall—a perpetual storehouse of specimens for the Arboretum.

Nor must you go until you have climbed to the top of the Hemlock Hill and rested in the shadow of its mighty giants and learned what centuries can do for trees, and wondered that in the city's heart so fine and wild a tract of woods as this should still exist to gladden the hearts of its inhabitants.

And soon there will be the new museum to see, the splendid gift of Mr. H. H. Hunnewell, with all sorts of treasures within, the great library, and valuable herbarium, which for years

Professor Sargent has been assiduously engaged in collecting, and now generously gives to the Arboretum, with specimens of fruits and flowers, of nuts and cones, of woods and roots, and hundreds of other things that are a delight to the lovers of trees and flowers.

Apart from all there is to rejoice the eye and cultivate the mind in this noble tree-garden, the Arboretum, the thought of its permanence should ever be present with one to fully appreciate how great and valuable and beautiful a gift it is to the

which will then shade its pleasant paths, and be the wonder and delight of other generations. The beauty which we find charming and promising in its immaturity will then be stately and solemn in its perfection of size and venerableness. Far away will be the memory of those who planned this forest for future ages, dim their personality, but unforgotten their names, for these the world "will not willingly let die." In this age, so full of personal struggle, of selfish greed, of individual ambition, it is well to know that men live with small thought of their own fame, who are planning wisely for the future happiness of millions.

Like the roots of the trees they plant, their beneficent mission is hidden from the sight of man, but the outgrowth of their deep-laid plans shall rise in the sight of all the people as a blessing far-reaching and magnificent as the great limbs of the Oaks and Beeches, which shall be their stateliest monument.

Hingham, Mass.

M. C. Robbins.

The Perforation of Flowers.

THE subject of the relations and adaptations which exist between flowers and insects does not appear to excite as much popular attention as many other branches of natural science which are no more interesting. Sprengel, Darwin and Hermann Müller have been the chief authors in giving us our present knowledge and interest in the study; Sir John Lubbock has helped to popularize it, and Professor W. Trelease and others have carried on the work in this country.

The perforation as well as the fertilization of flowers has received attention, but there is a wide field for further study for those who have leisure to pursue it, as it requires much time and patience, as well as closeness and accuracy of observation.

The accompanying figures, from drawings by Mr. C. E. Faxon, show a few characteristic perforations and mutilations, and also represent two of the principal kinds of insect which make them.

Any one interested in the subject will find an excellent brief review of the work already done, a fair bibliography, and a list of perforated flowers, in Professor L. H. Pammel's paper on the "Perforation of Flowers" in the *Transactions of the St. Louis Academy of Science*, vol. v., pp. 246-277.

The general beauty of flowers is usually not greatly marred by the perforations except in a few cases, as when the spurs of Columbines and corollas of Trumpet Creepers are much torn, which frequently happens.

The great object of the perforations by insects is the obtaining of the concealed nectar in an easy way. Very naturally, flowers which depend on insect agency for fertilization rarely produce seed when punctured if they are not also entered in the normal way. Perforating is only practiced by a small number of species of insects, and many, but not all, of the perforators do so because their tongues are too short to reach the nectar by entering the flower. Some obtain nectar from the same kind of flower, both in the normal way and by perforating.

The chief perforators of flowers, in this part of the continent at least, appear to be some kinds of humble-bees (*Bombus*) and carpenter-bees (*Xylocopa*). These insects have developed an unerring instinct as to the proper point to perforate the corollas from the outside, in order to readily get at the nectar. The holes made by the humble-bees and by the carpenter-bees are usually quite different and easily distinguished.

The humble-bees have short, stout, blunt jaws, ill adapted for cutting, and the perforations made by them are apparently always irregular in shape, and have jagged edges. It has been stated that the humble-bees often bore through the tubes of

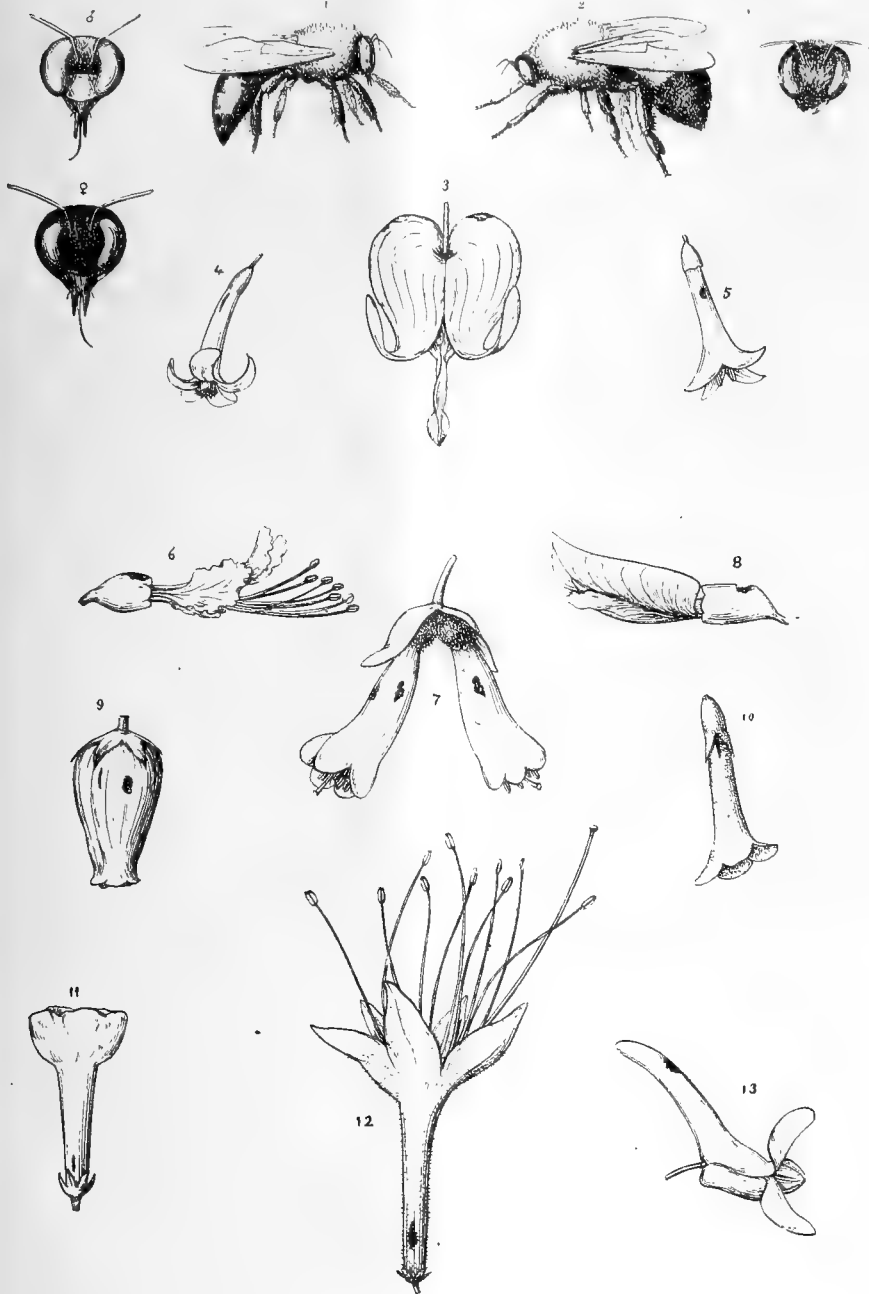


Fig. 7.—THE PERFORATION OF FLOWERS.

1. *Xylocopa* and heads of male and female. 2. *Bombus* and head. 3. *Dicentra spectabilis*, showing punctures. 4. *Ribes aureum*. 5. *Ligustrum Iboia*. 6. *Aesculus glabra*. 7. *Lonicera involucrata*. 8. *Caragana arborescens*. 9. *Andromeda Japonica*. 10. *Buddleia Japonica*. 11. *Mertensia Virginia*. 12. *Rhododendron arborescens*. 13. *Corydalis bulbosa*.

country. Nowhere else has provision been made for such a garden to exist for a thousand years under practically the same conditions of growth and development, and as one looks forward to the time when these fine young trees shall be mossy with age and decrepit with the wear and tear of centuries, there is great food for the imagination in the thought of the greater Boston that will encompass this wooded region, and of the differing race of men who will walk beneath the overhanging branches of the mighty Oaks and Chestnuts

their corollas with their maxillæ, but in all cases observed by me the mandibles were first brought into use in effecting an opening. The noise caused by the tearing is often audible for a distance of several feet.

The true jaws of the carpenter-bees are not any more prominent or better adapted for making clean-cut perforations than those of the humble-bees; but behind the jaws there is a pair of long, sharp-pointed, knife-like, jointed organs (maxillæ) which seem to be exclusively used on all ordinary occasions in making perforations. The inner edges of these maxillæ are nearly straight, and when brought together they form a sharp-pointed, wedge-shaped, plow-like instrument which makes a clean, narrow, longitudinal slit when it is inserted in the flower and shoved forward. The slits made by it are often not readily seen because the elasticity of the tissues of some flowers causes them to partially close again. When not in use the instrument can be folded back so that it is not conspicuous. The ordinary observer usually sees no difference between the humble-bees and the carpenter-bees, but they may be readily distinguished by a little close observation.

No doubt, in some of the recorded cases of perforations, carpenter-bees have been mistaken for humble-bees. The heads of all our northern humble-bees are rather narrow, retreating from the antennæ toward the sides, and with a more or less dense tuft of hair between the antennæ. The abdomen, as well as the thorax, is always quite densely covered with hair, which may be black or yellowish or in bands of either color. With possibly one or two exceptions, the only species I have seen doing the puncturing is *Bombus affinis*, Cresson.

The carpenter-bees (*Xylocopa Virginica*) of this region have the head very broad and square in front, and with no noticeable hair between the antennæ. The heads of the male and female differ strikingly. In the male the eyes are lighter-colored and are hardly half as far apart as in the female, and the lower part of the face is yellowish white. The female has eyes smaller, darker, and very far apart, and the whole face is perfectly black. The abdomen is broad, of a shining blue-black color, very sparsely covered with black hairs, except on the first large segment nearest the thorax. On this segment they are more dense and of the same tawny color as those on the thorax. But it is particularly from the character of the head that the amateur observer of the perforators may soon learn to distinguish between a *Xylocopa* and a *Bombus* as they work among the flowers. It is also interesting to know that the *Xylocopas* are not so inclined to sting as the humble-bees, and the males, of course, being without stinging organs, may be handled with impunity.

Among other insects, honey-bees have been said to perforate flowers, but authentic instances are rare of their doing much damage, or even making holes. I have only recorded a single instance, and in this a honey-bee was seen to perforate the fragile spurs of *Impatiens*. When searching for nectar they quite commonly use the perforations of other insects. Wasps and other allied insects also perforate for nectar. My only observations being a *Vespa puncturing* *Cassandra calyculata*, an *Andrena* (?) perforating the spurs of *Aquilegia*, and *Adynerus foraminatus* biting holes close to the base on the upper side of *Rhododendron*-flowers. The holes made by some of the wasp-like insects are often more or less circular and with clean-cut edges. The ravages committed by larvæ, beetles and other insects in devouring flowers, or parts of them, do not properly come under the head of perforations.

The question as to the cause of the handsome corollas of the Trumpet Creeper (*Tecoma radicans*) being so often split and torn has been accounted for in various ways in published notes on the subject. Humming-birds and ants have been blamed, the humming-birds being such constant visitors of these flowers that it really seemed as though they must be the authors of the mischief. I have often watched them when they appeared as though they were pecking at the blossoms, but careful examinations, both before and after their visits, always failed to show any trace of injury. Finally, on July 26th, 1890, I was rewarded by seeing a number of Baltimore orioles vigorously pecking at and tearing open a lot of fresh blossoms, and this observation was afterward repeated. That the oriole should do this was not surprising, considering its known habits in relation to some other flowers.

Arnold Arboretum.

J. G. Jack.

[Mr. Jack adds a list of sixteen plants whose flowers he has seen punctured by the carpenter-bee, and seventeen others whose flowers were punctured by the humble-bee. He names more than thirty other flowers which he has found perforated without having seen or identified the authors of the mischief.—Ed.]

Foreign Correspondence.

New Garden-plants of 1891.—I.

A REVIEW of the new plants introduced into cultivation and described in various periodicals for the first time during last year does not reveal much of very decided value. The bulk of them have already been noticed in the pages of *GARDEN AND FOREST*, but, following the practice of previous years, I propose to sweep them all together, marking specially those possessed of horticultural merit. Orchids stand a long way first in point of number. There are exceptionally few new introductions of any note. The hybrids, too, fall short in interest of those of the previous year. Of species, hybrids and wild varieties there are altogether seventy additions. Besides these, there are those Orchids which had previously been rare, but are now abundant in gardens in consequence of large importations made last year. The most noteworthy of these are *Cattleya labiata vera* (Warocqueana) and *Dendrobium Phalænopsis*. *Cattleya Rex* is another recent acquisition of quite exceptional promise.

Ada Lehmanni, Rolfe, differs chiefly in the foliage from the well-known *A. aurantiaca*.

Aërides Laurenciæ, var. *Amesiana*, Sander, is a grand variety of a grand Orchid. It has racemes over two feet long crowded with larger flowers than those of the type (Sander & Co.)

Angræcum fragrans, Spreng., is an interesting little species of economic value in the Island of Bourbon, where its leaves, when dry, are used as tea. (Kew.)

Cattleya Lowryana, Hort., is a pretty hybrid, raised by F. Sander & Co., and described by me in *GARDEN AND FOREST*, iv., 293.

Cirrhopetalum Collettii, Hemsley, is the largest, handsomest and most remarkable species of a remarkable genus. It was discovered in upper Burma by General Collett, and sent by him to Kew, where it flowered for the first time in June last. *C. Wendlandianum*, Kranzlin, is described as a new species which combines the characters of *C. Medusæ* and *C. fimbriatum*. It is not unlike General Collett's plant, and comes from the same country.

Cœlogyne Micholitziana, Kranzlin, is a white-flowered species in the way of *C. speciosa*, which Messrs. Sander & Co. introduced from Macassar.

Cochlioda Noëziana, Rolfe, is a charming little Orchid for the cool house, easy to manage, free-flowering, with elegant racemes of orange-scarlet and yellow flowers. It was introduced in quantity from Peru by Messrs. Linden, Brussels.

Cymbidium pulcherrimum, Hort., Sander, is a beautiful plant, with the habit of *C. Mastersii*, and a dozen or so waxy white flowers striped and flushed with crimson. Messrs. Sander & Co. have introduced it from northern India.

Cypripedium. There are numerous hybrids of this genus, as usual, few being of any real decorative value. The best are *C. Antigone* (from *C. niveum* and *C. Laurencianum*), *C. Berenice* (from *C. Rœbelini* and *C. Lowii*), *C. Ceres* (from *C. hirsutissimum* and *C. Spicerianum*), *C. Castleanum* (from *C. hirsutissimum* and *C. superbians*).

Dendrobium Leeanum, Hort., Sander, is a species from New Guinea, with the habit of *D. superbians*, the flowers being white, mottled with rose and tinged with green (F. Sander & Co.)

Disa Veitchii, Hort., is the best hybrid Orchid of the year. It was raised by Messrs. J. Veitch & Sons from *D. grandiflora* and *D. racemosa*, flowering within two years from the time the seeds were sown. We have made the same cross at Kew, besides other crosses between these and *D. tripetaloides*, and the seeds have germinated freely. It was proved long ago by Dr. Moore, of Glasnevin, that *Disas* could be easily multiplied by means of seeds. I am of opinion that in the three species here named we have very promising material for the production of a really valuable race of easily grown cool Orchids.

Epidendrum Dellense, O'Brien, is a pretty hybrid from *E. xanthinum* and *E. radicans*. It originated in the garden of Baron Schröder.

Habenaria carnea, N. E. Brown, has already been noted and figured in *GARDEN AND FOREST* (vol. iv., p. 475, fig. 76).

Lælia Arnoldiana, Hort., is a handsome hybrid between *L. purpurata* and *Cattleya labiata*, raised by Messrs. Sander & Co. The flowers are as large as those of *L. purpurata*, while the color is that of a richly marked form of the *Cattleya*. There is a good figure of it in *Lindenia*, t. 294. *L. grandis*, var. *tenebrosa*, is a distinct and beautiful variety, the sepals and petals colored a rich terra-cotta, the lip being crimson, with a broad wavy margin of white. It also is represented by a good figure in *Lindenia*, t. 290.

Masdevallia Rolfeana, Kranzlin, is a large-flowered species in the way of *M. velifera*, but colored rich chocolate-brown (Sander & Co.) *M. falcata*, O'Brien, is a hybrid between *M. Lindeni* and *M. Veitchii*, which promises to be a good garden-plant. It was raised by an English amateur, Mr. D. O. Drewett. *M. Mundyana*, Hort., is a hybrid between *M. Veitchii* and *M. ignea*, var. *aurantiaca*, which we owe to the skill of Messrs. F. Sander & Co.

Miltonia vexillaria, var. *Sanderiana*, is a beautiful variety which I recently described in *GARDEN AND FOREST* (vol. iv., p. 545).

Odontoglossum Cookianum, Rolfe, is a supposed natural hybrid between *O. triumphans* and *O. Sanderianum*. *O. dellense*, O'Brien, is another so-called natural hybrid, its supposed parents being *O. Pescatorei* and *O. proenitens*; a third doubtful hybrid is one named *O. Godseffianum*, which is said to suggest *O. Lindleyanum* and *O. triumphans*. It would seem that those who name Orchids are less certain than of yore, if one may judge by the number of introduced plants which are now dubbed natural hybrids. It would simplify matters considerably if such plants were either allowed to rank as distinct species or called varieties of those they are most like. We have a supposed natural hybrid among *Oncidiums* now, namely, *O. Larkinianum*, whose characters are thought to be a mixture of *O. curtum* and *O. Barclayanum*. I should call it simply a bright-colored variety of *O. curtum*.

Peristeria aspersa, Rolfe, was described and figured in *Lindenia*, t. 277. It is in the way of *P. pendula*, the pseudo-bulbs being as large as goose-eggs, and the short pendant raceme crowded with ten flowers, which are almost as large as those of *P. elata*, and colored yellow, thickly speckled with crimson, the lip being blotched with red. It is a fine plant, and was introduced by the Messrs. Linden, from Venezuela.

Phajus maculato-grandifolius, Hort., Veitch, is a hybrid between the two species, indicated in the name. It has the habit of the latter species, tawny, yellow flowers, with a poor lip, a character derived from *P. maculatus*.

Restrepia Imschootiana, Rolfe, is a pretty addition to the genus. It is very similar to *R. Storeyi*.

Restrepia strata, Rolfe, is a charming little Orchid, exactly like *R. elegans*, but with striped instead of spotted sepals. It was introduced from New Granada by Low & Co.

Schomburgkia Sanderiana, Rolfe, is similar to the bull's-horn species, *S. tibicinus*, but with shorter pseudo-bulbs and rosy, carmine flowers. The worst character in the plants of this genus is their shy flowering behavior under cultivation.

Sobralia macrantha, var. *Keinastiana*, Hort., is a white-flowered variety, as already noted in *GARDEN AND FOREST* (vol. iv., p. 305). It is in the collection of Baron Schröder.

Spathoglottis Ericsonii is a yellow-flowered species, which has been introduced by Messrs. F. Sander & Co., but I have not seen it. Possibly it is a form of *S. aurea*.

Stenoglottis longifolia, Hook. f., is a pretty, easily cultivated Orchid, for the cool house. It has been introduced from Natal to Kew, where it flowered this year, the erect scape, eighteen inches high, bearing its pretty, deep mauve flowers for about three months.

Thunia Mastersiana, Kranzlin, is a tall, long-leaved plant, with flowers about half the size of *T. alba*. It has been introduced from Monlmien by Messrs. F. Sander & Co.

London.

W. Watson.

Cultural Department.

Seed-sowing.

JANUARY is a dull month as far as garden operations are concerned. The days are so short that growing plants are almost at a standstill, so there is very little potting that can be done; but it is an excellent time to sow small seeds like those of *Begonias* and *Gloxinias*. It is well known that seeds germinate well when kept darkened, and partly owing to this, and because the temperature is under control at this season, small seeds will now germinate evenly and well, and they are not so liable to be washed out by overwatering, because, if they are properly sown, little water is needed until they are above ground.

To destroy all insects and weed-seeds in the soil intended for use it is a good plan to prepare it, sifted, ready for use, and then place it in a tin vessel and bake it for half an hour in a hot oven. This treatment will forestall all trouble with worms or weeds. When sowing a lot of Australian seeds sometime ago I tried the solution of copper, which is said to prevent pots from becoming green, and this, with baked soil, seemed to be a good way to reduce the growth of moss on the soil to a minimum, as perfectly new pots were used. The pots, however, became as green as if they had not been treated with copper, and I am apprehensive, therefore, that we have not yet found a sure remedy for this trouble. Last year from a twelve-inch pan and one packet of seeds we pricked off over 200 *Gloxinias*, about half of which flowered in six-inch pots in July—that is, in about six months from the time of sowing—and there is nothing unusual about this if good seed be used and a temperature of sixty degrees be maintained at night. Many amateurs think that it does not matter much what sort of a night temperature prevails in their greenhouse so long as frost is excluded, and often, too, on a mild night it may be ten or fifteen degrees higher than it was the night before, and then they wonder why tender seeds damp off or never come up. It should be made a point to maintain the right heat from the time the seed is sown, or if this cannot be done in the coldest weather, then no more seed should be sown for another month. In most greenhouses, fortunately, there is a warm corner where a small frame may be placed to put seed-pans in and keep them at a little higher temperature than that of the house itself, just to coax the seed a little at first. After they are up even, and large enough to prick off, lift with a small forked stick and transplant.

As to soil suitable for seeds, there are two cardinal points to be observed. Enough decayed leaf-mold should be added to the loam to prevent it from caking or becoming hard, and enough sand should be added to guard against its becoming sour or water-soaked. Soil of this quality and texture is suitable to receive any seed, large or small. Fertilizers are not desirable in the seed-pans or in the soil used for pricking off into boxes; but when the time comes to pot the young plants a richer soil will be beneficial, for they need nourishing as they gain strength. Such small seeds need very little covering; the pans should be filled to within half an inch of the rim, and a little very fine soil should then be sifted over the surface. If the pans are then well watered and allowed to drain for an hour, the seeds can be sowed evenly and a slight sprinkling of sand should be sifted over them. In watering care should be taken not to wash the sand. A fine sieve suitable for seed-sowing may easily be made with a piece of wire mosquito-netting tacked on to a shallow cigar-box after removing the bottom and the lid. This sieve will be found useful for cleaning seed, especially if wire-netting of different sizes can be procured.

South Lancaster, Mass.

O. O.

Notes from the Harvard Botanic Garden.

APHELANDRA AURANTIACA.—The bright flowers of this plant have a wonderfully enlivening effect in the stove during our dreariest weather. It is a shrub of somewhat dwarf habit, belonging, like many other good winter-flowering plants, to the *Acanthaceæ*. The large opposite ovate leaves, borne on short petioles, are rich dark green on the upper surface, and paler beneath. The flowers are produced in compact terminal spikes from three to six inches long. The corolla consists of a long narrow tube, the greater part of which is hidden by

greenish bracts and a conspicuous, spreading, two-lipped limb, the lower lip being deeply trilobed. The color is vivid orange-scarlet internally, and yellowish outside. The plant is of easy culture, and flowers freely when young. It is readily propagated from moderately firm cuttings with a slight heel of older wood, placed in strong bottom-heat and kept close. The young plants when potted should be placed in a high stove temperature, and have abundant water on roots and leaves while actively growing. A moist atmosphere is essential to hold in check the red spider until the leaves become hard enough to defy its attacks. They may be kept cooler and comparatively dry after flowering, and, like older plants, they should be cut back closely in spring, placed under stove treatment, and repotted when the young shoots have made a fair start. Seeds ripen freely, and seedlings make better plants than those obtained from cuttings. The seeds should be sown when fully ripe, in early spring, and the plants grown on as cuttings are in a stove near the glass. The plant was introduced from Mexico in 1844. The well-known variety, *A. aurantiaca* Roetzlii, was introduced from the same country in 1867. It is a rather better plant than the species, with silvery leaves and brighter flowers.

CESTRUM AURANTIACUM.—This shrub is an old occupant of greenhouses, of free growth and peculiarly graceful habit, and bearing attractive flowers in great profusion. Its dark green,

dom, and is destitute of foliage. The stems are flattened, of lively green color, and jointed in three-inch sections about an inch in width. The bright, rosy purple flowers are some three inches in length, and of bright, rosy purple color. They appear freely at the points of the shoots during the winter and last for several weeks, large plants being often in bloom for months together. A stove temperature and plenty of moisture are required when the plant is making its growth, but after that period the heat may be reduced by ten or fifteen degrees, when water should be applied sparingly and only to the roots. Small portions of the young stems are easily rooted in sandy soil, but the plants obtained by this method of propagation, though useful for hanging-baskets and marginal stage-pots, are not so effective as those secured by grafting on stocks of the Barbadoes Gooseberry, *Pereskia aculeata*. The stock is a plant of the same order as *E. truncatum*, with spiny stems and large, oval leaves. It is easily grown from cuttings to the required height, which varies according to the size of the specimen desired. Neat plants are obtained by using a single cion on stocks twelve or eighteen inches high, and for larger specimens taller stocks must be employed, inserting a cion at the top and others at intervals along the stem. In grafting it is simply necessary to cut away the upper portion of the stock, clean across at the required height; remove a small wedge-shaped piece at the top, and fit a portion of the



Fig. 8.—An Illustration of the use of Herbaceous Plants in connection with buildings.—See page 26.

oval leaves make an admirable setting for the bright orange blossoms, which are tubular and about an inch long, with a small, regularly parted, reflexed limb, and borne in large, loose panicles. Young plants are quickly obtained from cuttings of the soft wood at almost any season of the year. This *Cestrum* should be planted in a sunny part of the garden after the danger of frost is past, and in autumn it should be potted and placed in a cool greenhouse for the winter. In this way it will make a good display out-of-doors in summer, and again under glass in winter. It does equally well in a permanent greenhouse-bed. In any case, older plants should be regularly, though moderately, pruned every spring before vigorous growth begins, but not until the roots have started. Large, full-grown specimens bloom more freely in proportion to their size than those that are smaller, and it is therefore desirable to encourage their development. *C. aurantiacum* is a native of Central America, and was first introduced to European gardens in 1843.

EPIPHYLLUM TRUNCATUM.—None of the Cactus family excels in graceful beauty this little inhabitant of the Organ Mountains of Brazil. It is an old plant in gardens and universally admired, having been introduced about a hundred years ago. The growth has some of the remarkable characters of its curious relatives, but lacks their stiff outline and grotesque aspect. It has a rambling habit, branching with great free-

young stem about three or four inches long with growing tip to the opening thus made, binding it firmly with soft material. Openings made in the side of the stem should be treated in the same manner, and in a few weeks the binding may be removed. Grafted plants thrive most vigorously in a compost of rich loam, thoroughly decomposed cow-manure and sand, but those on their own roots give more satisfaction in a soil something poorer. The former should also be watered occasionally with weak liquid manure, when growing freely, and annually top-dressed with rich soil when repotting is inexpedient. There are many varieties of *E. truncatum*, or hybrids of that species, and the very slightly different *E. Russellianum*. These closely resemble their parents in all but the color of the flowers, which includes selfs of orange, purple, scarlet and pink, and shades of the three latter colors intermixed with white. Under its common name of Crab Cactus this plant is now brightening many a cottage window, and it has few superiors for this purpose among winter-flowering plants.

TOXICOPHLEA SPECTABILIS.—This is the most beautiful plant now flowering in our greenhouses. It is one mass of pure white fragrant flowers and deep verdant foliage. It was introduced from south Africa some twenty years ago, and is one of the most popular of indoor plants. It is of shrubby habit, with opposite, oblong-lanceolate leathery leaves four to five inches long. The Jasmine-like flowers, with narrow tube and

spreading, five-parted limb an inch across, are borne in large axillary clusters, almost hiding the stems and foliage when fully expanded. It thrives luxuriantly in a maximum winter temperature of sixty-five degrees, and may be grown in the open air, either in pots or planted out, during the summer months with entire satisfaction. The flowering season extends through the dullest portion of the year—winter and early spring. The individual flowers do not last longer than a few weeks, but new ones keep opening continually. It is propagated by cuttings of half-ripened wood during the spring months, with a moderate amount of bottom-heat. The plant likes abundant light, and it will not bloom freely nor long retain good health when closely shaded for any considerable period. It is widely known under the name of *Acokanthera spectabilis*, and possesses very poisonous properties. In south Africa it grows in sandy soil convenient to the shore, forming a large bush, and the natives of that region formerly poisoned their arrows with a jelly prepared from its bark.

Cambridge, Mass.

M. Barker.

The Experiment Garden.

ABOUT ten years ago I selected a few beans which had come from apparent crossing; and from that time by selection only, leaving all crossing to natural causes, I began the increase of varieties. The work at first resulted mostly in giving me some very curious and beautiful beans; but the fourth year struck out strains that bid fair to be valuable. In selecting I had in mind (1) to produce wax pods; (2) to secure them free of tendency to rust; (3) to enlarge the yield; (4) to get either white beans, or those that would cook white. There is also a good opening in market for a late Cranberry bean. Bearing such points in mind, I have secured white-podded beans, entirely free of rust, ten inches long, and ten beans to a pod. The yellow field Bean I have turned into a white-podded sort, with no change in the bean. It was easy to cross in the southern Cow Pea, but no special advantages have occurred from it. The result is a small wax pod, growing on vines that may be trellised like peas. It was difficult to secure crosses of the Lima, and those that I have so far secured are not of high value. The Lima may improve other Beans; it is not likely to be improved by them. But by selection I am in possession of a strain producing generally five beans to a pod, and occasionally six. By careful breeding I believe a six-beaned pod can be fixed, or even better.

In working out rust, I found that the Golden Wax was the worst possible parent. Nor am I sure that any sort from that crossing is quite sure of being spotless in bad seasons. Crosses of the Horticultural or Cranberry are peculiarly unstable, as are also those of the old Refugee. But I have been able to fix a few of considerable promise. From first to last I suppose I have obtained at least five hundred new crosses of Beans. Of these I have retained about one hundred. Each year shows some strain of value; but I am now intent only on suppressing the tendency of broken-up varieties to cross into new sorts.

One experiment only in Raspberries has given me a strain of very early sorts, some varying toward the Philadelphia, and others toward the Cuthbert, which were the parents. These give hope of securing at last an early berry as good as Cuthbert is for main crop. At least I have no results so good from any of the old sorts as from these. They need further testing, as I have so far only given them a crowded chance in my experimental plot.

Exactly what I have in the way of Grapes to offer I cannot determine; but returning to my home about October 1st, last year, I found there sorts already dried on my vines in a row of neglected seedlings. They were, as half raisins, delicious, and must have been very early. One was red, one white and one black. Small seeds, medium clusters and medium berries were the characteristics.

The experimental garden is the most interesting side of fruit-culture and farming in general. It does not often prove profitable, but we are able to contribute somewhat to the store of knowledge, and possibly may add to the list of human foods. These are but few of many attempts at improving fruits, vegetables and flowers, and, although I have reached no striking results, I consider the time and labor well repaid in the way of self-culture.

Clinton, N. Y.

E. P. Powell.

Autumn Snowdrops.—My experience with these plants has been very limited, but I am an anxious inquirer on the subject, and the note of Herr Max Leichtlin was even more interesting than many of the always valuable communications from Baden-Baden. In studying up the Snowdrops I have never been able to determine from the writings of the experts

the actual difference between the early-flowering forms—*Galanthus Olgae*, *G. nivalis* *Octobrensis*, *G. nivalis* *Corcyrensis* and *G. Rachelæ*. If I understand the matter rightly the two former bloom at the same season, and by some persons they have been considered identical. Snowdrops, like most plants, vary in size of flowers and in time of blooming, according to location and culture, and in the open, conditions of temperature, of course, will have their effect. In view of this it seems difficult to separate the variety *Octobrensis* from *Corcyrensis* with the present data. Herr Leichtlin says the segments of *G. Octobrensis* are a little narrower than those of *G. Corcyrensis*, yet I understand that he has raised some seedlings of the latter variety which have very narrow petals and which bloom a month earlier than the parent. It would be interesting to know how these latter compare with *G. Octobrensis*. Here we have a point where, if anywhere, the difference of the varieties could be determined and described. In a collection of Snowdrops secured by me last summer the varieties *Octobrensis* and *Corcyrensis* were said to have been included, and I was rewarded early in November with flowers of what I determined to be *G. Octobrensis*. Later I have been favored with a succession of blooms of what I suppose is *G. Corcyrensis*. These are nearly over, and have lately disappeared in a snow-bank, but to-day I picked a still perfect flower, and I find them of much superior form to some typical flowers just received from an English amateur friend. The segments are seven-eighths of an inch long by three-eighths broad, the ovaries very small and of a pale green, the inner segments white, with green markings and deeply notched. As Snowdrops usually improve after being well established, it is fair to assume that another season will see them in even better form. Whatever the varieties prove to be, I have a promise of Snowdrops from October till *G. Elwesi*, which is now showing color, is prepared to carry forward the succession.

Elizabeth, N. J.

J. N. G.

Tomatoes.—Ten weeks before the date when it is safe to set the plants out-of-doors, in any given locality, seeds of early Tomatoes should be sown in boxes in a warm greenhouse or in a sunny window. As soon as the little plants are fairly under way and before they get drawn, they should be transplanted into another set of boxes about two inches apart, or potted into three-inch pots. The latter plan is best when there is room. Four weeks before it is safe to finally place them in the open ground, they should be transplanted into a cold frame four inches apart each way, and gradually inured to the air. When carefully hardened, they should go outside as soon as it is safe for them; a light hoar-frost will do them little damage, and they had better be outside to start with the first warm weather. In a recent bulletin from the Cornell Station Professor Bailey mentions the advantage of early setting, and this is a point to be insisted on. I have had large stout plants, that had been gradually inured to the outer air, white with hoar-frost after going out, without suffering serious injury. The plants turn purple with the cold and stand still apparently for a while, but really they are getting a firm hold in the soil, and as soon as the weather warms up they are ready at once to do their best. I have in this way had plants, set out May 1st, in northern Maryland, give me an abundance of ripe fruit on the 20th of June, while some of the same lot of plants, kept back a week later in the frames as an insurance against loss of the first, did not give fruit until July 10th. Here, plants set out April 1st and exposed to slight frost, gave ripe fruit May 25th; and part of the same lot of plants, set out in middle of May, gave no ripe fruit until June 15th. While it is usually a great advantage to get the plants out at the earliest practicable moment, there is, of course, some risk connected with it, for the frost may come too severely. I therefore always take this risk only with part of my early plants, reserving the remainder to insure against entire failure should the first be killed.

Early Cabbages.—We are now (January 8th) transplanting our early Cabbage-plants (from seed some only ten days ago) into boxes, preparatory to putting them out in the cold frames. We prefer this practice to sowing the seed in the fall and wintering the plants over. While Cabbage-plants in this latitude stand outside without any trouble, it is hard to select the best time for sowing the seed in fall, as warm weather sometimes persists so late that the plants get overgrown, and then run to seed in spring instead of heading. These plants we are now pricking out into boxes will be ready to go into the open ground the latter half of February or earlier, and will be but little if any later than the fall-set plants, while none of them will run to seed. This practice is just as good northward as here, only the sowing should be deferred, in the lati-

tude of New York, until February, and the plants hardened off so as to go out late in March. In either place it gives a chance to use the sashes on the cold frames before the Tomato-plants need them, as the Cabbage-plants can go outside just at the time the Tomato-plants should be ready to go into the frames. The frames we are now putting the Cabbage-plants in have just been cleared of Lettuce, and will have constant use from now to April.

Raleigh, N. C.

W. F. Massey.

The Forest.

The Forestry Movement in the United States.

THIS was the title of a paper read before the late Forestry Convention in Washington by Mr. J. D. W. French, of Boston, Massachusetts. It was an exhaustive résumé of the direct efforts that have been made in this country for preserving our forests, and it was accompanied by a chronological list of the more important events in the history of the movement, such as the acts of Congress and state legislatures, the founding of various organizations, the publication of books and other literature bearing upon the subject. This last compilation, which Mr. French calls *Forestry Annals*, begins as early as 1681 with the ordinance of William Penn demanding "the reservation of one acre of trees to every five acres that were cleared," and gives a very complete record of the various occurrences, according to their dates, up to the present time. Our space will not admit the publication in full of these papers, and we can only touch upon the subjects treated. The complete record is, however, a valuable one, and will be of great use to the future historian of our forests. Mr. French first gave a graphic picture of the present condition of our woods, and began by quoting the language of an official of the state of Arkansas, who, when asked as to the state's policy regarding its timber, sent back the reply, "To get rid of the timber." If deeds speak louder than words, this has been the policy of all the states in the Union, and the priceless heritage which the Almighty planted in abundance throughout the land seems hastening, with the Indian and the buffalo, to destruction.

In speaking of the movement for preserving our forests, Mr. French said, "As early as the year 1817 an act was passed reserving lands producing Live Oaks and Red Cedars to supply timber for the navy. In 1831 another act was passed which included other timber, and imposed penalties for its violation. 'Upon this old law,' says Mr. Bowers, the Secretary of the American Forestry Association, 'having the construction of a wooden navy in view, the Government of the United States has to-day chiefly to rely in protecting its timber throughout the arid regions of the west, where none of the naval timber, which the law had in contemplation, is to be found. Can it be wondered that this act does not meet present conditions?' With all our boasted progress as a nation, we are dependent upon such an antiquated and inadequate law for the protection of our timber."

Other laws alluded to were several allowing the cutting of timber and the purchase of forest-lands, the so-called Timber Culture Act, repealed by the last Congress, and the section authorizing the President to establish reservations, of which we have several times spoken at length. The only action taken by an individual state to secure forest-reservation within its borders is that by New York, and yet the proposed Adirondack Park lacks the necessary legislation to become a realized fact.

The first attempt on the part of Congress to collect definite information in the interest of a systematic forest-policy was made in 1876, under which Dr. Franklin Hough was appointed by the Commissioner of Agriculture to make a report. This report remains a very useful book of reference, and others were afterward prepared by Mr. Hough. The Forestry Division of the Department of Agriculture was organized in 1881, and it remained under the charge of Mr. Hough for two years, when he was succeeded by Mr. N. H. Egleston. In 1886 this Division was made an organic part of the Department, and Mr. B. E. Fernow became the Chief of the Division, with whose efficient labors in various directions our readers have been kept informed.

The American Forestry Association was organized by Dr. John A. Warder in 1875, and since 1882, when the session was held in Cincinnati, there have been yearly meetings. This Association has done much valuable work in arousing public interest, in promoting the formation of local associations and in urging measures of desirable legislation by publishing from time to time its proceedings, and in other ways diffusing

useful knowledge on the subject of forestry. Notwithstanding the apathy of the public and the neglect of Congress this Association has steadfastly trusted that the good sense of the American people will finally bring them to realize the importance of this work and to compel legislative action in the lines which they have indicated.

The work of various other societies is next summarized, and honorable mention is made of the individuals who have not only done practical work in the way of tree-planting, but who have been instrumental in creating a proper public sentiment.

Under the head of "Literature" Mr. French gives a brief account of the books published by Michaux, Nuttall, Emerson, Sargent and others, and a notice of periodicals like *Forest Leaves* and *GARDEN AND FOREST*. The establishment of the Arnold Arboretum in 1872 is noted as an important advance in furnishing object-lessons in every branch of forest-science, and the Missouri Botanical Garden is described as another agency which may be of great value in the same direction.

Mr. French considers the reservation of forest-lands without laws for their care and protection about as absurd as it would be to build a mill and then fail to supply it with machinery. "It is true, however," continued Mr. French, "that the Secretary of War, in answer to a request made by the Secretary of the Interior, has sent squads of cavalry to guard some of the parks, as the Yellowstone, the Sequoia and the Yosemite. Under the present condition of our laws there can be no better plan than to employ our army as forest-guardians. The army is eminently fitted to become custodians of our forests, and, moreover, it can be called into service immediately without going through the tedious process of passing laws. Now, if a knowledge of forestry could be added to its other desirable and available qualities, and proper laws of administration should be adopted, the problem of the care and preservation of our forests would seem to be in a fair way of solution. Why might there not be a Chair of Forestry at West Point, and a Forestry School to teach the soldiers practical forestry on one of the western reservations? Could any better use be made of a portion of the army in time of peace than to instruct it in the principles of forestry? Would not a better class of men volunteer, and would there not be fewer desertions, if forestry and other subjects of importance were taught at some of the army posts? An army post might, under these circumstances, become a school at which a soldier could learn something more than mere military routine.

"With instruction in forestry at West Point there would in a few years be a number of men competent to teach. England has been compelled, from the difficulty of obtaining properly trained men for the Indian forest-service, to establish a forestry school in connection with the Royal Indian Engineering College at Cooper's Hill. It might be a wise thing for our Government to send a few capable young men to Europe to study forestry, with the understanding that they should return to give a certain number of years to Government service. No matter what the laws are, there can be no proper forest-administration until we have men in charge who have at least some knowledge of forestry.

"The most important thing, however, at the present time, is to save the forests on the public domain at all hazards from fires and thieves, and this can be done under present laws only by the use of the army. The army, as it now exists, is quite capable of carrying out what is called the 'common-sense management,' which consists, according to Mr. Fernow, in avoiding unnecessary waste, in protecting against fire, in keeping out cattle where young growth is to be fostered, and in not preventing, by malpractice, the natural reforestation. One of the bills prepared by the American Forestry Association, and known as the Dunnell bill, authorized the employment of the army as custodians of the public forests.

"Legislation is certainly needed, and this can only be brought about by persistent agitation. This important subject should be urged upon public attention at home, on the rostrum and in the newspapers. Drill it into your Congressmen with the keen-edged sword of your votes. In this way, and in this way only, can we hope to influence public opinion."

Correspondence.

Eckford's Sweet Peas.

To the Editor of GARDEN AND FOREST:

Sir,—The fact that thirteen out of the thirty new Sweet Peas of Henry Eckford have received first-class certificates from the Royal Horticultural Society of England, gives him the pre-eminent place as a hybridizer of this flower, and therefore

some extracts from a letter recently received from him may be of interest to the lovers of this flower:

"I first took up the Sweet Pea about fifteen years ago, collecting six of the most distinct varieties I could find, carefully fertilizing the one with the other, year after year selecting the most promising for recrossing, keeping in view properties most desirable to develop—that is, color, form, substance and size. At first progress was slow, but after seven or eight years' patient working, the varieties, some of whose praises you have so well sung—Orange Prince, etc.—made their appearance. When I first began working with the Sweet Pea, experts in the art, as far as I could learn, had come to the conclusion that it could not be further improved, and in the first two or three generations of the work this appeared a fair conclusion. But I had been for many years working on the improvement of various florist flowers which had proved eminently successful, and a first rebuff did not deter me from further attempts. With some of the results you are acquainted, and there are others which, of course, can only be presented to the public as I can get stock of them. It is a great satisfaction to know from all parts of the world that the public appreciate my gems."

Mr. Eckford's Sweet Peas have striking merit, and especially the expansion of the Standard is making an essentially new flower. The new varieties for 1892 show a still nearer approach to lemon-yellow.

Ellington, Conn.

W. T. Hutchins.

Recent Publications.

Japanese Art in the Arrangement of Flowers.—II.

In the earlier styles of the art of flower-arrangement, Mr. Conder tells us, the use of many different flowers in one composition was allowed. But this is opposed to the principles of the purer styles afterward developed. "Combinations of two or three different species are, however, very common, and especially applied to vessels having two or three openings. In all compositions, single or combined, the special nature of the different materials employed is in each case carefully kept in mind, and anything at all suggestive of the inappropriate must be scrupulously avoided." We have already noted some of the principles which govern these combinations; "but," says Mr. Conder, "important distinctions are made between trees and plants, and between land and water plants. The locality of production, whether mountain, moor or river, considerably influences the arrangement adopted. . . . In arranging two or more species in one composition variety must be secured by combining trees and plants. In the case of three lines being used, the branches of a tree should never be supported on both sides by a herbaceous plant, nor should an herb be placed in the centre with a tree-arrangement on either side. This fault is called by a term which will be better understood if freely translated as 'sandwiching.' In a triple arrangement it is plain that two branches of the same kind of growth must be used, but these must adjoin and not sandwich the remaining one. As an example of a defective arrangement may be taken a composition with Irises (herbaceous) in the centre and branches of Azalea and Camellia (trees) on either side. A correct composition would be one with a Plum-branch in the centre with a Pine-branch on one side and a Bamboo-stem on the other. . . . Herbaceous plants are regarded as female with respect to trees, which are considered male because the former are weaker and more graceful in character than the latter. A slender herb flanked on either side by tree-branches would give a weakness of effect to the centre composition, and the reverse arrangement would give too much strength to the centre and weakness to the sides. In addition to this, such arrangements would have a more or less symmetrical character, and symmetry is disliked throughout the whole of the art under consideration. Like most arbitrary rules, such directions were often departed from by the more advanced professors, and there are even recognized exceptions which are universally admitted as correct. For example, two kinds of Pine-branches may be used together with the Plum-branch in a double arrangement. . . . The branches and foliage of evergreens, and even of deciduous trees, are much used in floral compositions, the arrangement often being without a single blossom. It is, however, laid down as a general rule that no flower-bearing plant is to be employed with leaves only. Nor must plants or trees which bear leaves at blossom-time be used with flowers alone. The following are exceptions to this rule: the large-leaved Chinese Orchid has a flower, but it is very insignificant and grows below; and this plant is, therefore, technically treated as a flowerless one. The Iris Japonica is sometimes arranged for its

leaves only, before the flowers appear, and it then receives a special name. The leaves of the Summer Narcissus are faded and withered before the flowers appear, and they may therefore be removed and discarded. All flower-compositions must partake as much as possible of the spirit of the season in which they are used. Spring arrangements should be straight and powerful in line, like the growth of early vegetation; summer arrangements must be full and spreading; while those of autumn should be spare and lean, and those of winter withered and dreary."

Here again we see how diametrically opposed to western ideas are the ideas of the Japanese. To us flowers are most beautiful and most precious, as a rule, when most conspicuously out of season; and it is safe to say that a vase full of Roses in midwinter gives the average American or European more delight than it would in midsummer. To us the sentiment of a flower merely seems increased by the unexpectedness of its appearance, and one which in winter carries us back to the sun and breezes of June would never be objected to on the score of inappropriateness. In truth, we have no conception of what the Japanese mean by appropriateness, either in this or in any other art; and when we try to understand their point of view, it sometimes seems as though so many recondite, philosophical and emblematical considerations preface their enjoyment of the works of nature that this enjoyment cannot be as fresh and spontaneous as it is with us. But such ideas are, of course, quite mistaken. It is a question whether we shall ever rise to such a many-sided, delicately developed love for the works of nature as the Japanese possess; but we may be sure that every added meaning they read into their flower-arrangements increases, not lessens, the pleasure they confer; and that every added degree of keenness and fineness in æsthetic perception has the same effect.

Of course, color as well as form is considered by the Japanese in their flower-arrangements, and also the shape and character of the leaves, no less than the direction of the stems which bear them. Moreover, the flower-vase is almost as important as its contents, and the relationship of the two is a special and complicated subject of study. There are V-shaped vessels and broad ones, vessels for water-plants, flower-baskets and Bamboo vases, hooked vessels, suspended vessels, flower-chariots, and so on, and in each of these classes there are many varieties, and the choice of each is dictated by the special character of the plants employed or the special effect desired in their combination. To secure plants in the exact positions desired, from which a hair-breadth of deviation would seem calamitous to a delicate eye, special flower-fasteners are required, and these are often made of bronze and given ornamental shapes appropriate to different kinds of plants. Flower-trays and stands must also be carefully considered, as the effect of a beautiful arrangement placed in an appropriate vase might be ruined if it were set on an inappropriate support. Mr. Conder gives many pages of cuts showing flower-vases and stands with and without flowers. Their variety and the subtle distinctions the Japanese draw between them may confuse the occidental mind to such an extent that it will seem, indeed, as though years of patient study would be needed before one should dare to introduce a flower as decoration in a room. Yet even this is not the end of the study of the Japanese. The position of flowers in rooms is another vital point of consideration, and one to which Mr. Conder devotes a special chapter. Then he gives a long chapter to the ceremonial uses of flowers and their significance in the elaborate etiquette of the people. What, one wonders, would the guest in an American house think if, as a special compliment, he were invited to make an extemporary arrangement of flowers, being presented for the purpose with certain suitable flower-stems or blossom-clad branches and all the necessary utensils and implements? Special flowers are named for betrothals, for wedding festivities, for coming-of-age celebrations, for promotions in rank, for the ceremony of religious retirement, for old-age celebrations, for farewell gatherings, for presentation to the sick, for death anniversaries, for house-warmings, for duty ceremonials, for poetry meetings, for incense meetings, for placing before household shrines, for use when rain or fine weather is prayed for, and for that favorite pastime of the Japanese which they call moon-viewing. Nothing could better explain the delicacy of the Japanese artistic sense than Mr. Conder's little description of this last-named ceremony and its floral accompaniment. "The more important dwellings," he says, "have a special chamber with open galleries, from which the sight of the moon-lit landscape can be enjoyed. The floral arrangement occupies the recess of the chamber, and has, of course, no real connection with the outside prospect, but in the flower-composition itself the idea of the moon-lit

landscape is expressed. A branch of a Pine-tree is used, and between the principal and secondary lines of the composition a special branch is introduced, fancifully called the moon-shadow branch; a gap is also formed between the foliage, bounded by the special branch called the dividing-branch. In the composition the idea is to suggest both the opening through which the moon can be partially observed, and the dark branch which appears to cross its surface. To fully appreciate the analogy one must be familiar with the scenery of Japan, and have seen the irregular Pine-trees standing out against the starry heavens."

The concluding portion of Mr. Conder's book is filled with practical examples. Many plates illustrate arrangements of more or less complexity, and each is carefully explained and the reason of its beauty pointed out. As we look through these pictures we are more and more impressed with the fact that, to a Japanese, our own methods of flower-arrangement must indeed seem crude, barbarous and confused. It is impossible to imagine western people having the patience to develop an art of flower-arrangement so elaborate and suggestive as that of the Japanese; nor is our mental temper such that we could ever care, as they do, for recondite, philosophical, historical rules and sentimental meanings to be expressed by flower-compositions. Nevertheless, the artistic aim of the Japanese artist is never subordinated to any other, and a very keen feeling for beauty really underlies most of the distinctions which he explains in ways which to us seem fancifully intellectual rather than æsthetic. It is a pity, therefore, that Mr. Conder's book should be so large and costly that we cannot expect it to have much direct influence upon public tastes in this country and in England. But many of its lessons will certainly be popularized in the pages of horticultural papers. We wish that his illustrations might be largely reproduced, for, of course, pictures are needed to point the meaning of his words; but, unfortunately, his title-page bears the legend "All rights reserved," which, we presume, makes it impossible to copy his cuts without special permission.

There has here been no attempt, we repeat, really to review his book, which is an admirable monument to his own industry and intelligence, as well as to the artistic qualities of the Japanese. The value of such a work depends upon each of the details it explains and upon their full and orderly exposition. All we have attempted to do is to show by a few quotations how interesting and novel it is, and to recommend its careful perusal by any one who may be fortunate enough to find a copy at hand.

Notes.

We learn from a Washington dispatch that President Harrison has issued a proclamation reserving from entry the Pecos River tract, in New Mexico, which is alluded to in another page of this issue.

In Japan the Pæony is cultivated in long sheltered beds, generally lying beneath one of the chief rooms in the house, from which its splendid blossoms can be surveyed. It is the favorite flower of the upper classes, and, being cultivated to produce enormous flowers, often bears blossoms nine inches or more in diameter.

When too little water is given to house-plants the wilted and drooping leaves soon indicate what the trouble is, and it is very easy to apply the remedy before any serious injury is done. When too much water is given, however, the injury is not discovered until perhaps the leaves turn yellow and begin to fall, and it is then sometimes too late to repair the damage. This means that it is easier to injure house-plants beyond remedy by giving too much water than by giving too little.

Monsieur Henry Lévêque de Vilmorin has been elected First Vice-President of La Société Nationale d'Horticulture de France in place of the late Auguste Hardy. This is the most important horticultural office in France, as the President of the society, usually some distinguished statesman, is merely a figure-head, the real administration of the affairs of the society devolving on the First Vice-President. The society is to be congratulated in being able to place itself under the direction of one of the best-equipped and most famous horticulturists of his day, and the worthy representative of a family which has been distinguished for generations for its scientific attainments, its commercial enterprise and integrity, and its zeal in worthy effort to ameliorate every rural art and science.

According to Professor Massey the central Oak-belt of North Carolina is peculiarly the home of the Peach, just as the mountain region is of the Apple. This is especially true of the up-

land sandy ridges which rise some five hundred or six hundred feet above the sea, and which, while in the geographical limits of the Oak-belt, are really Pine-lands. Professor Emery, of the North Carolina Experiment Station, while rambling last year through the forest near a health-resort known as Southern Pines, came across what had once been a Peach-orchard, but which had grown up with Pines twenty or thirty years old. Yet here among these conifers were a number of the old Peach-trees, with trunks measuring nearly a foot in diameter and full of fruit. Most of the trees had been blown over, but even these had put out new heads, which were full of fruit. In Davis County, between the forks of the Yadkin River, wild Peach-trees are abundant along the fence-rows and in old sedge-fields, and these bear large crops with no cultivation or care.

In an article on Christmas supplies in the *Journal of Horticulture*, London, it is said that one of the most striking features in the markets is afforded by the numerous auction sales of imported fruit, and is a matter of surprise how such quantities can be disposed of, and what becomes of home-grown fruits. Thousands of baskets of American apples have been received and sold within the past few days, bright, even, well-selected and well-packed fruits, which would command purchasers anywhere, the Newtown Pippins and Baldwins being the favorites. Side by side with the American apples were bushels of English apples, and the contrast was almost painful. These last were irregular, unselected fruits, seemingly shot into baskets without heed and care, handsome fruits and rubbish intermingled, with the result of a very low average. This is one great defect of English growers, and however the cultivation of fruit may be improved, it will never produce the proper results until the cognate matters of packing and displaying receive due attention.

Mr. Romeyn S. Hough writes us that in a copy of Evelyn's *Silva*, which bears the date of 1664, is a marginal note which was penned perhaps a century ago by some former owner of the book whose name is lost. As it relates to American trees and forcibly illustrates the value of tree-planting, it will doubtless interest our readers: "The false Acacia in North America (*Robinia Pseudo Acacia*, Linn.), vid. Monthly Review for April, 1788, *Memoirs of Agriculture* published by the Royal Society of Agriculture at Paris; *Memoir* 9, by Monsieur Saint Jean de Crève Cœur. A farmer on Long Island planted in the year of his marriage an old worn-out field of fourteen acres with this Acacia, resolving not to touch it till his first child should be of age to marry. His eldest son, when twenty-two years old, anxious to settle by himself, applied for assistance to his father, who then sold out of this wood (to a ship-master) timber to the value of 6,250 French livres, about £260 sterling, which he gave to his son to purchase a plantation in the County of Lancaster. Three years afterward he sold as much as brought the same sum, with which he apporportioned a daughter. In fine, without any other resources than the sale of wood from these fourteen acres, planted in the year of his marriage, he has provided for all his family, and the wood continues to be still equally productive."

The January number of the *American Agriculturist* celebrates the semi-centennial anniversary of its establishment by a series of articles on the great progress which has been made during the last fifty years in agricultural science and practice in America. Interesting articles for this number have been prepared by experts to show the improvement in agricultural machinery and methods of cultivation, in the breeds of domestic animals and poultry and in the different varieties of grains, fruits, vegetables and flowering-plants. There are articles, too, on such comparatively new industries as the export trade in beef, the production of beet-sugar and the growing of vegetables under glass. Dr. Riley writes of the important position which applied entomology now holds in agricultural practice; Dr. Halstead of the new methods of treating fungous diseases of plants, and Dr. Jenkins of fertilizers and their increased use, while Mr. Berckmans discusses the development of pomology, and Mr. Ellwanger records the growth of the nursery industry. Altogether the present condition of American agriculture, when compared with what it was fifty years ago, warrants Mr. C. Wood Davis' prophecy of a brilliant future. This issue of the *Agriculturist* also contains portraits of all its editors, beginning with Mr. A. B. Allen, who still lives at the age of ninety years, and was able to contribute an article to the jubilee number of the magazine which he founded in 1842. Our readers will unite with us in wishing a long continuance of prosperous life to the magazine under the efficient conduct of Dr. Hexamer, who now guides its policy.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLES:—The Beauty of Evergreens in Snow. (With figure.).....	37
Dr. Mayr on the Parasitic Fungi of North American Forest-trees	37
Notes of a Summer Journey in Europe.—V.....	J. G. Jack. 38
Is Grafting a Devitalizing Process?—I.....	Professor L. H. Bailey. 39
PLANT NOTES:—Some Recent Portraits.....	40
FOREIGN CORRESPONDENCE:—New Garden-plants of 1891.—II.....	W. Watson. 40
CULTURAL DEPARTMENT:—Christmas Roses.....	D. Dewar. 42
Seasonable Hints.....	W. H. Taplin. 43
Begonias.....	J. N. Gerard. 44
Winter-flowering Aquatics.....	Wm. Tricker. 44
Citrus trifoliata as a Hedge-plant.....	Professor W. F. Massey. 44
The Pin Oak.....	Joseph Mehan. 45
CORRESPONDENCE:—The Senecios of the Canary Isles.....	H. Christ. 45
Plants for the Sea-shore.....	J. W. Harshberger. 45
Chamæcyparis squarrosa.....	J. M. N. 46
RECENT PUBLICATIONS.....	46
NOTES.....	48
ILLUSTRATION:—A New England Winter Scene, Fig 9.....	41

The Beauty of Evergreens in Snow.

ONE of the loveliest of all winter effects is seen when wet and clinging snow falls upon the green branches of conifers, emphasizing their beautiful outlines by its "ridge of pearl."

The peculiar delicacy of snow-shadows, with their tender bluish tint, has something to do with the charm of such a scene as is depicted on page 41, and black and white, however subtly shaded, cannot convey that combination of color peculiar to a winter landscape, that fills the eye with a sense of beauty whose evanescence adds to its precious quality.

The sheeted ground sparkles in sunshine with myriad lights; its seemingly unbroken surface, if studied, reveals innumerable soft dimplings, where lurk the shadows that diversify its whiteness. Through the mass penetrate here and there the brown spears of plants and tall grasses, their dry leaves and shrunken blades tipped with silver, their faded blossoms feathery with plumes of snow. Small trees, springing in the shelter of their elders, are overwhelmed with an ermine burden, beneath which they bend like a boy-prince weighed down by a regal mantle too heavy for his youthful shoulders, and their broken shadows fall upon the snow in wavering patches of purple and gray. Where the drifted snow has been melted by an underlying hillock, its dash of yellow-brown gleams like a golden boss upon a silver shield.

The tiny tracks of woodland creatures, which have stolen forth for provender, make interesting suggestions of hidden life in the solitude, guiding the traveler into the shelter of the trees, where in the crotches of the branches the snow lies massed in great heaps. Each bough shows its outline doubled by a furry trimming. The tall trunks are flecked with snowy patches. If the tree be deciduous a reproduction of its line, firm and graceful as a Japanese drawing, lies across the white ground. Here at your feet, like a master's sketch, can be seen emphasized the swelling of

the limb as it throws out a bough, the delicate interlacing of branches, the intricate network of the topmost tangle of twigs. The pyramidal form of the evergreen flecked with light is tenderly reproduced in a tint hovering between blue and gray, which is the despair of the painter, as it is the delight of his eye.

Near the base of the trees where the ground is sheltered, the snow has been warded off, and the soft brown carpet nestles warmly up to the roots and stems, while the wide branches curve with their tips in the snow, making an arched wigwam, protected from the storm. The top needles, agitated by a morning zephyr, have shaken off their hoary hoods, and stand up green and shining against the pale blue of a winter sky, innocent of cloud. As the sun climbs higher there is a low patter among the branches, a fall of snow from an upper limb; soon the rebound of a released branch brings on an avalanche, as the sturdy tree struggles to shake itself free from the encumbering mass. Then from the tree distils an aromatic fragrance as the wet branches grow warm with the approach of noon. The stir of the branches, the rustle of the melting snow falling among them, give a low sweet murmur, the song of the young Fir-tree dreaming of the far-off Palm; of the old Hemlock sighing for some Indian dryad of its youth; of the Pine whispering a saga of a sea-fight and a storm.

The effect of looking down a woodland-path when the trees on either side are laden with snow is of some strange massive architecture of marble, through which one wanders, wondering at the freaks of the builder who has planned these bewildering arches and groinings, supported on columns of diverse proportions. Fantastic forms are everywhere apparent, and the stillness is that of a deserted cavern furnished with stalagmites that ape a forest. For Nature in her various processes is at one, whether she builds trees of stone, or stiffens her forests into a mammoth cave of wonders; and to see these underground effects beneath a blue sky is one of the shows of winter, which has its own museum of delights, wherein ice and frost and snow play marvelous and varied rôles for the beholder.

Dr. Mayr on the Parasitic Fungi of North American Forest-trees.

IN GARDEN AND FOREST, of December 24th, 1890, appeared a review of Dr. H. Mayr's *Die Waldungen von Nordamerika*, in which the reviewer criticised that portion of the work relating to the fungi found on forest-trees. Since the appearance of the review Dr. Mayr has kindly sent to the editor of GARDEN AND FOREST specimens of some of the fungi mentioned in his work, with the request that they be submitted to the reviewer and the result of his examination printed in GARDEN AND FOREST. The following notes are therefore offered in compliance with Dr. Mayr's request:

In our former notice we expressed the opinion that what was considered by Dr. Mayr to be a new species, and called *Rhytisma punctiforme*, was in reality the *R. punctatum* described by Fries in 1819, founded on the *Xyloma* of Persoon, 1801, a species found both in Europe and North America, where it is common, having been recorded in this country in 1831 by Schweinitz. An examination of Dr. Mayr's specimen of *R. punctiforme* shows that it is undoubtedly *R. punctatum*, Fries, which is considered by Rehm and some other recent writers to be a good species, although it was regarded by Tulasne as a form of *R. acerinum*. In our review it was also remarked that, as far as could be told from Dr. Mayr's description and figures of his *Microsphaera Corni*, it was identical with the *M. pulchra*, Cooke and Peck, described in 1872. Examination of the specimens sent confirm the accuracy of our former statement, the appendages, asci and spores agreeing entirely with those of *M. pulchra*, and whether one agrees with those mycologists who believe that *M. pulchra* should be referred to a still older species or not, if the spe-

cies be regarded as distinct, there is no doubt that the name *M. pulchra* should be adopted.

We have examined carefully the specimens of *Lophodermium infectans* and *Hysteriopsis acicola*, and in both cases found only young perithecia, without any trace of spores, in the absence of which it is impossible to say to what genus they belong, still less to what species. Dr. Mayr states that he did not find mature stages, and that being the case, we do not think that he was warranted in saying anything more than that the two immature forms in question belonged to some indeterminable species of the order Hysteriaceæ. We are unable to understand the reasons given for making the new genus *Hysteriopsis*. On page 340 it is said "the genus (*Hysteriopsis*) differs from those existing in Europe, all of which live on young shoots (*Triebbewohner*)." But only a few lines previously he says that "the needles of *Picea Sitchensis* become diseased as if under the influence of a *Lophodermium macrosporium*." Now, since *L. macrosporium* attacks the needles (see Hartig, *Wichtige Krankheiten der Waldbäume*, pl. vi., fig. 1-4) it is difficult to see why it is necessary to separate *Hysteriopsis* from *Lophodermium* because it grows upon the leaves. In fact, the admitted resemblance to *L. macrosporium*, which certainly does attack the needles, makes it probable that, if *Hysteriopsis acicola* be not really an American form of *L. macrosporium*, it is, at least, a nearly related *Lophodermium*, which, in the absence of sufficiently well-developed material, cannot be determined.

The specimen of *Puccinia Abietis* on *Abies concolor* we were particularly glad to be able to examine because the original description differs so much from that of any of the *Uredineæ* known to us that we were unable to recognize the fungus as a species of that order. Dr. Mayr considers that there is at first an æcidium, and that there later develops in and near the æcidia a mass of uredospores, from which, at length, develop teleutospores. The accompanying figures, however, bear little resemblance to any uredo or teleutospores known to us. An examination of the specimens themselves shows the æcidia with their peridia, spores and spermogonia. It is unnecessary to consider what the name of the æcidium is, because, owing to the fact that the specimens are too old, what we might say on this point would be of the nature of a conjecture rather than an exact determination. The important fact revealed by our examination is that what is called by Dr. Mayr the uredospores is in reality not a uredo at all, but a species of *Tuberculina*, a genus well known to infest *Uredineæ* in their different stages. Whether, in the present case, we have before us the common *T. persicina*, or some closely allied *Tuberculina*, can hardly be definitely settled since the material is too old. If the æcidium has evidently been attacked by a parasitic *Tuberculina*, the latter has in turn been attacked by some mold belonging to the *Hyphomycetes*, and it is this second parasite that Dr. Mayr considers to be the teleutospores of the æcidium. But the whole structure is quite different from any teleutospore. The black, carbonaceous mycelium, very irregular in the shape and appearance of the cells, sometimes bears at the tips two-parted cells, but quite as frequently they are not two-parted, but more like what are called *Macrosporium* spores. It would be quite hopeless trying to name this young mycelium, for one finds very frequently just such forms resulting from the germination of *Pleospora* and other related genera. It is enough to say that the teleutospores of Dr. Mayr are merely the young stages of some parasitic *Pyrenomycete* which would be referred to the form genera *Cladosporium*, *Macrosporium*, etc., according to the division of the ultimate cells, which, in the present case, is not constant.

In conclusion we would express our indebtedness to Dr. Mayr for his courtesy in submitting, quite unsolicited, his original specimens to us for examination, and, although unable to agree with his determinations of the fungi, we gladly recognize his friendly treatment of a reviewer whose views differ from his own.

Notes of a Summer Journey in Europe.—V.

THE route from Zurich to Munich took me over Lake Constance to the quaint little harbor of Lindau, in Bavaria. Between Lindau and Munich there are large areas of planted Spruce-forests, and at this time they were looking in fine order and well kept. In many tracts, containing thousands of trees, the trunk of each tree was protected from invasions of ascending insect enemies by a band, presumably, of the same insect-lime which Professor Fernow has advocated so strongly in *GARDEN AND FOREST* (vol. iv., p. 142) and elsewhere. This precaution was particularly directed against the Nonne (*Liparis monacha*), a large moth, the larvæ of which are said to have done damage to the extent of hundreds of thousands of dollars to the coniferous forests of Bavaria and the adjacent countries in the summer of 1890. Close along the line of railway were myriads of young seedlings, and wherever there was an abandoned gravel-pit or a worn-out piece of soil it had been thickly planted with young Spruces, which would soon make profitable what would otherwise be waste land.

Of the trees planted in the streets of Munich, Lindens, Lombardy Poplars, the Red-flowering Horse-chestnuts, known as *Æsculus rubicunda*, and Planes (*Platanus*) seem to be the favorites. The Planes here were in poorer condition than in almost any other place visited where they were much planted, and the Lombardy Poplars were chiefly noticeable on some long streets leading out of the city. The healthiest trees noticed here were two double rows of the Red-flowering Horse-chestnut which partially surround the narrow park-like Promenade Platz. These trees (all grafted, of course) are planted about twenty-four feet apart each way, and give a dense cool shade without growing so high as to obstruct the light and air from buildings. The foliage maintained its characteristic dark green color, and although the trunks were unprotected, few of them showed any signs of mechanical injury. Within the Promenade Platz are well-arranged groups of shrubbery and a few unobtrusive beds of herbaceous plants.

Munich boasts a Royal Botanic Garden, situated well within the city, and of some interest in certain directions. Much pride is evidently felt in the large and high Palm-house, and also in the Alpine Garden, which is built of irregular sandstone-rocks containing innumerable pockets calculated to hold moisture. An attempt has been made to divide this Alpine Garden into sections according to the geographical distribution of the plants, but this arrangement does not seem to work well, or, at least, does not appear to be consistently carried out. Sections are marked out for European, Mediterranean, Taurian, Himalayan and other alpine floras, but the space devoted to each is necessarily absurdly small. Any such arrangement necessitates a good deal of duplication of species, and, of course, few botanic gardens can afford to do more than show a very few typical species of the different genera. The alpine here were in a very vigorous condition, and showed special care. Some of the plants grow so rampantly that they are with difficulty kept within bounds. Such plants as spread from underground shoots are not easily managed in an ordinary rockery because the roots and shoots get among the rocks, where it is difficult to cut them out.

Campanulas and *Potentillas* were the most conspicuous plants left in bloom. The tallest and most conspicuous of the Campanulas was *C. Americana*, three or four feet high, with its long spikes of blue flowers. Other more dwarf and more graceful species still blooming were *C. turbinata*, with wide-spreading white corollas; *C. thyrsoides*, with dense erect spikes of pretty white flowers, the corollas densely hairy within; *C. pusilla*, a very dwarf species, with light blue or white flowers, and a species of *Symphandra*, whose blossoms might easily be mistaken for those of a Campanula. A little *Aubrieta* made a good compact rockery plant for blooming at this season, while *Drypis spinosa* attracted attention by its innumerable small star-shaped, silvery white flowers.

As the temperature in winter here rarely goes lower than twenty or twenty-five degrees below zero of Reaumur, it is possible to grow some of the species of *Cistus* in the open air; and several plants of these shrubs were still bearing some of their pretty flowers, which, by their petals and stamens, seem to suggest an alliance between a wild Rose and a St. John's Wort. A handsome fruiting clump of our American Cranberry, growing in the rockery, was found to be planted in a hollow decaying log, which was sunk into the ground and filled with peaty soil.

The collection of herbaceous plants is arranged in good clumps and well separated; and, as would be expected, the composite plants were making the best show at this season (July 29th), although *Veronicas*, *Campanulas*, *Stachys*, etc.,

were also conspicuous. The collection of grasses and sedges was particularly in fine condition. As showing the care and trouble which is in some cases taken in the attempt to secure the best conditions for the rarer plants, it may be mentioned that specially constructed beds are allotted to the *Myricas*, *Andromedas*, *Vacciniums*, the moisture-loving *Kalmias*, etc. The foundations of these beds are made in the form of large flat tanks, with double sides, lined with cement. These tanks are filled with good-looking peaty soil, surrounded by and saturated with water. Yet, with all this care, the plants look miserable and do not seem to thrive, and, undoubtedly, most of them would do much better under ordinary garden cultivation in a good mixture of peaty soil and sand and with some slight shade from the direct rays of the sun. The plants here were suffering from want of drainage, for, although they like moisture, they do best when placed within reach of water by the roots, instead of being planted in it.

Several acres in the garden are set apart as an arboretum, or, at least, are specially devoted to trees and shrubs. There are no trees remarkable for size or rarity, and many of the shrubs suffer from the effect of being planted in grass instead of in beds under cultivation. A very good collection of wild *Roses* particularly suffered from this treatment. This custom of planting isolated specimens of shrubs in the turf prevails in a number of German gardens, but in none of those seen did it seem to be satisfactory, except with such kinds as were of vigorous, coarse growth. It may be argued that they grow among grass or herbage in a wild state, but those who use this argument lose sight of the fact that in nature these shrubs and other plants flourish well only where they have congenial soil, situation and neighbors. Moreover, they often grow in considerable masses or clumps together, thus affording mutual assistance and protection in shading the ground and keeping down weeds and other possible intruders. Except under very exceptional conditions and among the strongest-growing species, wild *Roses* and other plants of similar habit are certain to suffer from having grass growing closely about their roots and stems; certainly to see these plants, as isolated specimens dotting the turf, produces anything but a natural effect, while the bushes lose the great advantage which is gained by even a very slight cultivation. In rich soils and in turf composed of some of the more slender kinds of grasses they may do better than any I saw.

It seemed singular not to find any conifers among the trees, and to see our *Pines*, *Spruces*, *Firs*, etc., growing in pots or tubs, as though they were tender sub-tropical or tropical exotics. The smoke and soot of the city are said to cause the death of these evergreen species in a comparatively short time if left in the open air during the winters. Every autumn they are brought into cold houses or pits for protection. I do not know whether protecting the plants by canvas caps, or otherwise, and allowing them to remain out, has ever been tried, but it would seem to be worth while making some experiments in this direction, because the item of storage of the plants is considerable. The only evergreen conifer in the garden, permanently growing outside, was a poor, forlorn-looking specimen of the *Austrian Pine*, which was sixteen or eighteen feet in height.

In labeling the plants some small porcelain or enameled labels are used; but most of the permanent labels are made of galvanized iron, zinc or wood, cut into oval shape and fastened to wooden or flat bar-iron stakes. The surface of these labels is painted white, and the lettering gives both the Latin and a best-known German popular name.

Arnold Arboretum.

J. G. Jack.

Is Grafting a Devitalizing Process?—I.

PROFESSOR L. H. BAILEY, of Cornell University, read a paper on this subject before the Peninsula Horticultural Society at its meeting last week in Dover, Delaware. A portion of it is printed below, and the remainder will follow in a subsequent issue:

To the popular mind the process of grafting is akin to magic, and entirely opposed to the laws of nature. It is mysterious, and seems to represent the extreme power which man exercises over natural forces. And yet the operation is very simple, and the process of union is nothing more than the healing of a wound. It is in no way more mysterious than the rooting of cuttings, and it is not so unnatural if by this expression we refer to the relative frequency of the occurrences of the phenomena in nature. Natural grafts are by no means rare among forest-trees, and occasionally the union is so complete that the foster-stock entirely supports and nourishes the other. Cut-

tings, however, are very rare among wild plants; in fact, I know of but one instance in which cuttings are made entirely without the aid of man, and that is the case of certain brittle *Willows* whose branches are easily cast by wind and snow into streams and moist places, where they sometimes take root. But the mere unnaturalness of any operation has no importance among phenomena attaching to cultivated plants, for all cultivation is itself unnatural in this ordinary sense.

Nor is the union of cion and stock any more mysterious or unusual than the rooting of cuttings; in fact, it has always seemed to me to be the simpler and more normal process of the two. A wounded surface heals over as a matter of protection to the plant, and when two wounded surfaces of consanguineous plants are closely applied nothing is more natural than that the nascent cells should interlock and unite. In other words, I do not see why two cells from different allied stems should refuse to unite any more than two cells from the same stem. But why bits of stem should throw out roots from their lower portion and leaves from their upper portion, when both ends may be to every human sense exactly alike, is indeed a mystery. We regard healing as one of the necessary functions of stems, but rooting cannot be so regarded.

I have said this much by way of preface in order to free your minds of any feeling which you may possess that grafting is in principle and essence opposed to nature, and therefore fundamentally wrong. A large part of the discussion of the philosophy of grafting appears to have been random because of this assumption that it is necessarily opposed to natural processes.

It does not follow from these propositions, however, that grafting is a desirable method of multiplying plants, but that the subject must be approached by means of direct and positive evidence. During the last three years the opponents of the system of grafting have made the most sweeping statements of its perniciousness. This recent discussion started from an editorial in *The Field*, an English journal, which was copied in *The Garden* of January 26th, 1889, with an invitation for discussion of the subject. The article opens as follows: "We doubt if there is a greater nuisance in the whole practice of gardening than the art of grafting. It is very clever, it is very interesting, but it will be no great loss if it is abolished altogether. It is for the convenience of the nurseryman that it is done in nine cases out of ten, and in nearly all instances it is not only needless, but harmful. If we made the nurserymen give us things on their own roots, they would find some quick means of doing so." Profuse discussion followed for a period of two years, in which many excellent observers took part. Some of the denunciations of grafting are as follows: "Grafting is always a makeshift, and very often a fraud." "Grafting is in effect a kind of adulteration. . . . It is an analogue of the coffee and chicory business. . . . Grafted plants of all kinds are open to all sorts of accidents and disaster, and very often the soil or the climate or the cultivator is blamed by employers for evils which thus originated in the nursery. . . . If in certain cases grafting as a convenience has to be resorted to, then let it be root-grafting, a system that eventually affords the cion a chance of rooting on its own account in a natural way." "Toy games, such as grafting and budding, will have to be abandoned, and real work must be begun on some sound and sensible plan." "Any fruit-bearing or ornamental tree that will not succeed on its own roots had better go to the rubbish-fire at once. We want no coddled or grafted stuff when own-rooted things are in all ways infinitely better, healthier and longer-lived." These sweeping statements are made by F. W. Burbidge, of Dublin, a well-known author, whose opinions command attention. The editor of *The Garden* writes: "We should not plant any grafted tree or shrub so far as what are called ornamental trees and shrubs are concerned. There may be reason for the universal grafting of fruit-trees, though we doubt it."

I have not cited these quotations in any controversial spirit, but simply to show the positiveness with which the practice of grafting is assailed. And as the presumption is in favor of any practice which has become universal, these statements possess extraordinary interest.

The reasons advanced for these denunciations of grafting are three, so far as I can learn. These are, (1) the citation of numerous instances in which grafting (by which I mean both grafting and budding) has given pernicious results; (2) the affirmation that the process is unnatural; (3) the statement that own-rooted plants are better—that is, longer-lived, hardier, more virile—than graft-rooted plants.

1. Citations of the injurious effects of grafting are usually confined to ornamental plants, and the commonly cited fault of the operation is the tendency of the stocks to sucker and choke the graft. This fault is certainly common, but, on the other

hand, there are numerous instances in which it does not occur, as, for instance, in Peach, Apple, Pear and many other fruit-trees, and in many ornamental trees. In fact, it is no more common, in the plants which have fallen under my observation, than is the pernicious suckering of plants grown from cuttings, as in the Lilacs, cutting-grown or sucker-grown Plums and many other plants, in which suckers must be assiduously kept down or they will choke the main stem which we are endeavoring to rear. These remarks apply with equal force to every citation which I have ever seen of the ill effects of grafting. The cases simply show that the operation has been a failure or is open to objections in the particular instances cited, and afford no proof that there may not be other plants upon which grafting is an entire success. For myself, I am convinced that grafting has been too indiscriminately employed, and it is apparent to every one that there have been many failures in the practice. But this does not prove grafting wrong any more than malpractice of physicians proves that the science of medicine is pernicious. If there are plants upon which grafting is entirely successful, then all must agree that the operation itself is not wrong, per se, however many cases there may be to which it is not adapted.

2. The proposition that grafting is unnatural, and therefore pernicious, is a fallacy. In the first place, there is nothing to show that it is any more unnatural than the making of cuttings, and if naturalness is proved by frequency of occurrence in nature, then graftage must be considered the more natural process of the two, as I have already shown. One of the most determined writers upon this subject has said that "it is quite fair to say that raising a tree from seed, or a shrub by pulling it in pieces (cuttings), is a more natural mode of increase than by grafting." I cannot understand by what token the author is to prove that pulling a plant in pieces is more natural than grafting; and there has been no attempt, so far as I know, to show that it is so.

But the whole discussion of the mere naturalness of any operation is really aside from the question, for every operation in the garden is in some sense unnatural, whether it be transplantation, pruning or tillage; and it is well known that these very unnatural processes may sometimes increase the longevity and virility of the plant. Plants which receive an abundance of food and are protected from insects and fungi and the struggle with other plants are better equipped than those left entirely to nature. It is the commonest notion that cultivation is essentially an artificial stimulus; that it excites the plant to performances really beyond its own power, and therefore devitalizes it. But this is a fallacy. All plants and animals in a state of nature possess more power than they are able to express, and they are held in a state of equilibrium, as Mr. Spencer puts it, by the adaptations of environment. Once the pressure of existing environments is removed, the plant springs into the breach and takes on some new feature of size, robustness or prolificacy, or distributes itself in new directions. The whole series of benefits which arise from a change of seed is a familiar proof of this fact, so that if cultivation, domestication, or, in other words, unnaturalness, may be sometimes a stimulus, it is not necessarily so. Cultivation differs from natural conditions more in degree than in kind. Or, as Darwin writes, "Man may be said to have been trying an experiment on a gigantic scale; and it is an experiment which nature during the long lapse of time has incessantly tried."

Plant Notes.

Some Recent Portraits.

THE new volume of the *Botanical Magazine*, the one hundred and fifth of the entire series, opens with a figure (t. 7212) of the great Iris of Lord Howe's Island, *Moræa Robinsoniana*, whose portrait has already appeared in these columns, and whose flowering last summer at Kew, for the first time in Europe, was one of the floral events of the English capital. The other figures are devoted to *Chirita depressa* (t. 7213), a native of China, an herbaceous plant with small bright purple flowers. This is a member of the family of Gesneraceæ, in which are many plants which have been wonderfully improved by cultivation, and it is not improbable that the present species may, with careful attention and selection, develop into a good garden-plant. *Cirrhopetalum Thourasii* (t. 7214), an interesting, although not very showy-flowered Orchid, upon which Lindley long ago founded the genus, and a native

of Mauritius and the islands of the south Pacific Ocean. *Iris Fosteriana* (t. 7215), a bulbous species, discovered in 1884 by Dr. Aitchison in Afghanistan, where he found it growing plentifully at Badghis "in dry soil on the low hills at an elevation of three thousand feet above the sea-level." From a horticultural point of view this plant differs from all its allies in the variety of the colors of the different parts of the flower, the outer segments being bright yellow, with a spreading blade streaked with black, while the inner segments are bright lilac. The figure is from a plant which flowered in Professor Foster's garden at Cambridge, for whom Mr. Baker has named the species. *Primula Poissoni* (t. 7216); this is one of the new Chinese plants discovered by the Abbé Delevay, and raised in the Paris garden from seeds sent home by him. Like *Primula Japonica* and *Primula imperialis*, it produces superposed whorls of flowers; these are bright rosy lilac, and are produced in great profusion, the Kew plant from which the figure is made having produced eight scapes of flowers and flowered itself to death. The facility with which Primroses can be improved by cultivation is shown by the fact that the native specimens of this species are very small, with leaves only two or three inches long and a solitary slender scape with only a few flowers in a whorl, whereas on the cultivated plant the flower-stock was fully two feet high and as thick as a goose-quill.

Foreign Correspondence.

New Garden Plants of 1891.—II.

STOVE AND GREENHOUSE PLANTS.—Exclusive of Orchids, the best new stove and greenhouse plants introduced into cultivation last year must be credited to Kew. Few trade collectors think it worth while to pay any attention to foliage or flowering plants other than Orchids, for the reason that, as a rule, there is not much money in them. The botanical gardens in the colonies and numerous correspondents in various parts of the world, however, send to Kew various interesting and good decorative plants, and these are eventually distributed among nurserymen and others who desire to try them. Of the fifty or so new stove and greenhouse plants recorded the following are of most promise horticulturally:

ALBERTA MAGNA.—Mr. W. Bull offered this plant in his catalogue of new plants for last year. It has been in cultivation several years at Kew, but, so far as I know, it has never yet flowered in England. It is rubiaceous, closely allied to *Cinchona*, which it resembles in habit and foliage; the flowers, which are small, are in dense panicles, and colored bright red. It will most likely prove a good greenhouse-plant, as it comes from a high altitude in Natal. The treatment which suits *Luculia* ought to answer for the Alberta.

ALLAMANDA WILLIAMSONII, Hort.—Probably only one of the many forms of the variable *A. cathartica*, but differing from those previously known in gardens by its shrubby habit and floriferousness. It has been brought into notice by B. S. Williams & Son.

ARISTOLOCHIA GIGAS, var. STURTEVANTII, Watson.—This came to Kew from Mr. Sturtevant. It flowered freely in one of the tropical houses, and, so far at any rate as Europe is concerned, it was the most remarkable new plant of the year. It is named in compliment to Mr. E. D. Sturtevant, for reasons stated in GARDEN AND FOREST, vol. iv., p. 546.

BROWNEA CRAWFORDII, Watson.—This is a hybrid between *B. grandiceps* and *B. macrophylla*, which flowered at Kew last year, and was named in compliment to the late W. H. Crawford, of Cork, who raised it. In the size of the inflorescence and color of the flowers it is even superior to *B. grandiceps*.

BAUHINIA GALPINI, N. E. Br.—This is a most promising flowering-shrub for the warm greenhouse, which has been introduced to Kew from the Transvaal. It has two-lobed



Fig. 9.—A New England Winter Scene.—See page 37.

leaves and crowded racemes of large handsome crimson flowers, borne on numerous twiggy branches. It grows to a height of about six feet. A figure of it was published in *Hooker's Icones* last year (pl. 1994).

CRINUM ROOZENIANUM, O'Brien.—This is said to be near *C. Americanum*, although the growth resembles *C. erubescens*. The flowers are four to twelve in an umbel, six

to eight inches long, with recurved segments three to four inches long and three-fourths of an inch wide, white. It has been introduced from Jamaica by A. Roozen & Co., Haarlem.

COCOS PYNARTII, Hort., is a seedling form of *C. Weddelliana* with very narrow leaf-segments. It was raised by Monsieur Pynaert, of Ghent, and figured in the *Revue de*

Horticulture Belge last year (p. 91, fig. 15) under the name of *C. minima glauca*.

CLIVENCHARIS PULCHRA, Hort.—It was stated last year that L. Van Houtte, of Ghent, had succeeded in raising a bigeneric hybrid from *Clivea* and *Eucharis Amazonica*, of which further detail would presently be published. Such a cross, if successful, cannot fail to be of exceptional interest.

DIPLODENIA ILLUSTRIS, var. *GLABRA*, is a handsome stove-climber with a woody root-stock, annual climbing stems, thick ovate leaves, and large rosy red flowers. It has been introduced from Brazil, and flowered at Kew last year.

EPIPHYLLUM GAERTNERI was introduced several years ago under the names *E. Makoyanum* and *E. Russellianum*, var. *Gaertneri*. It was at first supposed to be a hybrid between *Cereus* and *Epiphyllum*, but it now proves to be an introduction from Brazil and a third good species of *Epiphyllum*. It is a beautiful stove-plant, at least equal to the best of the many varieties of this genus grown, and at the same time abundantly distinct from them all. A figure of it was published in the *Botanical Magazine* (t. 7201).

IMPATIENS MIRABILIS.—This extraordinary species has lately been noticed in GARDEN AND FOREST. It is a native of Malaya, where it forms an erect, naked, succulent trunk four feet high, and as thick as a man's leg; leaves nearly a foot long, and large inflated, fleshy, golden yellow flowers. It flowered at Kew, and was figured in the *Botanical Magazine* (t. 7195).

LILIUM LOWII, Baker.—This is a new species similar to *L. nepalense*, with white flowers. It has been introduced from northern India by Messrs. H. Low & Co. (See GARDEN AND FOREST, vol. iv., p. 352.)

MOREA ROBINSONIANA is not a new plant, but its flowering at Kew last year for the first time revealed its true character, which is that of a handsome floriferous *Iris* of exceptional dimensions. It is figured in GARDEN AND FOREST (vol. iv., p. 552.)

NERINE PANCRATIOIDES, Baker, is a new edition to the genus which Mr. O'Brien has introduced from Natal. It has long narrow leaves, a scape two feet high bearing an umbel of from twelve to twenty flowers one inch long, with small square bifid scales between the filaments.

PRIMULA IMPERIALIS, Jungh.—This is the gigantic Primrose from the mountains of Java, which was raised at Kew from imported seeds and flowered for the first time last year. It has a broad rosette of leaves each fifteen inches long by five inches wide, an erect scape three to four feet high, bearing whorls of deep yellow flowers.

PRIMULA POISSONII, Franchet, is a new and beautiful species from Yun-nan which flowered at Kew in June last. It resembles *P. Japonica* in habit, but differs in the leaves and in the color of the flowers, which is rich rosy mauve with a yellow eye. A single plant of this species has produced no less than twelve scapes in one season.

STREPTOCARPUS GALPINI, Hook. f.—I described this in GARDEN AND FOREST, vol. iv., p. 534, from plants which have been introduced at Kew from the Transvaal. It is the prettiest of all the species of this genus.

THRINAX MORRISII, Wendl.—This was discovered by Mr. D. Morris, the Assistant Director at Kew, in the island of Anguilla, in the West Indies. It differs from all known species of *Thrinax* in the dwarfness of its stature, none of the many mature plants seen by Mr. Morris exceeding three feet in height. It has elegant foliage, and promises to be a useful garden Palm.

TULBAGHIA NATALENSIS, Baker, is a Cape bulb with no more beauty than *Mignonette*, but, like the latter, it has the charm of delightful fragrance. It has been introduced to Kew from Natal. *T. alliacea* is cultivated for the sake of its purple flowers. Its linear leaves have a strong onion-like odor.

WAHLENBERGIA UNULATA, Cham.—A straggling herbaceous plant which may be grown in suspended baskets, so that its thin leafy stems may hang and display its campanulate

deep blue flowers. It has been introduced from the Cape to Kew.

Among popular greenhouse-plants perhaps the most noteworthy additions last year were the beautiful dwarf *Cannas*, whose large richly colored flowers and good nature under ordinary cultivation have made them prime favorites in England. Two pretty Japanese varieties of *Azalea amœna*, hardy in England, were sent out by J. Veitch & Sons. This firm have also added many new varieties of greenhouse *Rhododendrons* and *Hippeastrums*.

HERBACEOUS PLANTS.—There was an extraordinary number of varieties of popular herbaceous plants introduced last year, such things as *Dahlias*, *Gladioli*, *Pæonias*, *Carnations*, *Rudbeckias*, *Delphiniums* and *Iris*es being considerably reinforced by additional sorts of first-rate character. Of new species there were very few, the best of them being as follows: *Chionodoxa grandiflora*, a variety of *C. Luciliæ* with erect racemes and larger flowers than the type. It was previously known as *C. gigantea* (T. S. Ware & Co.) *Galanthus Alleni*, Baker. A pretty addition to cultivated *Snowdrops*, characterized by short broad leaves and pure white flowers (Caucasus). *G. nivalis*, var. *Elsæ*, Burbidge, a variety with larger flowers and broader leaves than *G. Corcyrensis*, from Macedonia. Another variety, named *Racheliæ* by Mr. Burbidge, has larger flowers than the last-named, and blossoms in October and November. *Iris Fosteri*, Baker, is a handsome species of the *Caucasica* group. It has yellow flowers blotched with deep violet. *Lilium Brownii*, var. *chloraster*, Baker, is a new introduction to Kew from western China, and differs from the type in having broader leaves, larger flowers, with a broad green midrib to each segment, and deep red pollen. *L. Martagon* × *Hansonii*, Baker, is a hybrid raised by C. G. Van Tubergen, Haarlem, from the two species indicated in the name. *Watsonia densiflora alba* is a very pretty Cape bulb which has so far stood out-of-doors at Kew, where it flowered for the first time last year. It has erect spikes eighteen inches high, with the flowers in a dense head like a ripe wheat-ear; pure white.

A CORRECTION.—*Miltonia vexillaria*, var. *Sanderiana*. The plant to which I referred under this name in GARDEN AND FOREST (vol. iv., p. 545), and again in the list of new plants of 1891 (vol. v., p. 31), had, I find, been previously figured and described in *Revue de l'Horticulture Belge*, 1891 (p. 73), under the name of *M. vexillaria*, var. *Leopoldiana*, Reichb. f. "One of the prettiest and rarest of the varieties of this *Miltonia* is this which was dedicated by Reichenbach to Leopold II. It had been received by Monsieur Paynaert direct from Monsieur Paten, of Antioquia, in Colombia. It has been exhibited before the Horticultural Society of Belgium and the Royal Society of Agriculture and Botany at Ghent, and was unanimously awarded a certificate of merit."

London.

W. Watson.

* Cultural Department.

Christmas Roses.

IT is only within the last few years that these charming hardy midwinter flowers have become so popular in English gardens, and curiously enough the desire on the part of a few specialists to arrive at something like finality in the nomenclature of *Helleborus niger* and its varieties, has been the means of bringing to light varieties unheard of previously. While the controversy was in progress distinct varieties were cropping up all over the country, each with its special markings, different time of flowering, etc. The varieties *altifolius*, *major* and *angustifolius* may perhaps be taken as the standard ones. They were pretty well known to the older botanists, and were the varieties usually found in general collections. To these have been added, within recent years, *vernalis*, *Riverston*, hybrid *Caucasicus* of gardens, the *Bath* variety, the *Brockhurst* variety, *Madame Fourcade*, *St. Brigid*, *W. Brockbank*, etc., some of them having probably been in gardens for many years, and grown simply as the Christmas Rose. The gathering of a collection together was the inevitable result of so much correspondence, the comparing and describing of which

has been very gradual. In addition to these, however, a host of new forms have cropped out as a result of selection from seedlings raised in this country, and also from the numerous importations that are now of annual occurrence. North Germany, the Austrian Tyrol and other well-known localities supply our markets, but so many equally good, if not better, forms are being raised from seed that we will soon be able to dispense with collected roots altogether. A collection of plants from the Austrian Tyrol, which we had the pleasure of going over in flower, were plentiful in forms resembling Madame Fourcade, Riverston hybrid and others, which led to the conclusion that all or most of these varieties were at one time or other imported.

Our chief difficulty with Christmas Roses in the open air in England, and which we suppose will be greatly aggravated in America, is the uncertainty of our season, especially mid-winter, when the flowers are most in request. A simple covering of glass is of no use whatever, and if the flowers are wanted for cutting, and wanted clean, they must be grown indoors, and out of the reach of frost. We believe that when the plants are gently forced the flowers are larger and cleaner, and last considerably longer in water. A large group of Italian forms have shown beautiful flowers for many weeks now in the wild garden at Kew, and although invisible during frosty weather they are up as fresh and bright as ever when a change takes place. They have been here without any special cultivation for several years, and every winter brings a greater abundance of flowers, which are much admired by visitors. This mode of dealing with surplus stock will be found a very advantageous one even in private gardens, and large quantities of flowers for cutting could in this way be secured. Hellobores, at any rate the niger section, are gross feeders, and the question of manure, or no manure, in their cultivation, will depend largely on the nature of the soil in each particular locality. Where the soil is heavy and rich little or no artificial feeding will be required, but where it is light or sandy a sprinkling of heavy loam should be given in addition to the manure. In the latter soil, and in dry seasons especially, a mulching of leaves or other material during summer will be necessary. Where Christmas Roses are annually lifted and potted for greenhouse decoration it is essential to keep a double set, lifting them alternately, and never planting back those used for the house, until all danger from frosts is past, otherwise the young tender leaves are destroyed, and the plants greatly weakened.

Of the varieties of *H. niger*, *altifolius*, also called *maximus*, is one of the commonest in English gardens, and perhaps the finest of the whole niger group. When grown in shady sheltered situations the flowers come pure white, but where exposed they are shaded with rose on the outside, which, in our opinion, enhances rather than detracts from their beauty. The leaves are large, leathery, and the stalks as well as the flower-stems are deep purple.

Angustifolius is apparently an old garden-plant, the name being well known in Sweet's time. It was not, however, until 1876 that Miss Hope's variety was recognized as the true *H. niger angustifolius*. The flowers are quite three inches in diameter, white, and often tinged with rose on the outside; the leaf-divisions narrow, and the stalks and flower-stems green, sparingly spotted red. There are two other well-marked forms of *angustifolius* to be found in gardens. The Brockenhurst form, in which the leaf-stalks and flower-stems have scarcely a trace of purple markings, usually bears two flowers; the other, St. Brigid's Christmas Rose, has pure snow-white flowers somewhat cup-shaped, with flower and leaf-stalks of a rich apple-green.

The Bath variety is almost intermediate between *H. niger* and *H. niger angustifolius*. The flowers are large, flat, pure white; the flower and leaf-stalks spotted red, the latter slightly furrowed.

Caucasicus is a very misleading name, there being a species, *H. caucasicus*, belonging to the *Orientalis* section. It has been widely distributed in England under the above name, and it is one of the most profuse-flowering varieties we possess. The leaflets are coarsely and sharply toothed, and much resemble the Italian forms; flowers pure white, tinged rose on the outside; the flower-stalk densely spotted red, and the petiole stout and deeply furrowed.

Madame Fourcade is a charming variety belonging to the *altifolius* set. The flowers are nearly three inches in diameter, pure white; the flower-stalk and petiole red-spotted, the latter slightly furrowed.

Of the variety major there appear to be a large number of forms in cultivation, although varying but slightly from the old type. The leaves are very massive, the flowers large, white, with a pale pink tinge.

Riverston hybrid might almost be classed as a form of *angustifolius*. It is said to be a hybrid, but we fail to find any justification for this statement. It is a robust plant, with flowers nearly four inches in diameter, white, tinged rose. The petioles are green, and the flower-stalks red-spotted.

Vernalis seems allied to the variety *Caucasicus*. The flowers are large, white, tinged rose; petioles green, deeply furrowed; the flower-stalk red-spotted. A useful form, and a free flowerer.

W. Brockbank, named as a fitting compliment to Mr. Brockbank, who has done much to make this family popular in England, is very distinct, remarkable in the flowers being so deeply cupped; flowers about three inches in diameter, pure white; petiole and leaf-stalk sparingly spotted.

There are numerous other forms equally desirable, but the above will suffice to show the wealth of hardy midwinter flowers within the reach of all.

Kew.

D. Dewar.

Seasonable Hints.

THE propagation of stock for the coming season is an operation that should be now looked after, the midwinter and early spring months being specially favorable for rooting many cuttings. Fine Cocoa-fibre is a very useful material in the propagating-frame, both for holding plunged cutting-pots and for use in such pots in place of soil or sand, since it retains moisture for a long time and is a good conductor of heat.

I have used this fibre successfully for a variety of cuttings, such as those of *Pandanus Veitchii*, *Ananas*, *Ficus*, *Crotons*, *Calatheas*, etc. It is also an excellent material in which to plunge freshly potted plants of delicate kinds, and is a cleanly and durable substance for such use.

Bouvardias now claim attention, whether the root-cuttings or tops are used. In the latter case the tips of the shoots alone are valuable, and these should be quite soft and succulent. It is a waste of time to put in hard cuttings of Bouvardias, and for most of the single varieties, with the exception of *Bouvardia jasminiflora*, the system of root-cuttings is the least troublesome.

Two excellent plants that should be included in all collections are *Asparagus plumosus* and *A. tenuissimus*. Their foliage is of special value for cutting, as it will keep in water for weeks. Unfortunately, *A. plumosus* is somewhat difficult to increase, as the cuttings seldom root satisfactorily, and division of the roots is a rather slow process, but if planted out in a greenhouse like *Smilax* it will sometimes seed, and then with reasonable care a stock may soon be secured. *A. tenuissimus* is readily propagated by cuttings, which may be made from almost any firm side-shoots, and will usually root in a few weeks.

Canna-seeds may be sown now, since there is an advantage in sowing them early, for sometimes they are rather obdurate about germinating. Many growers soak or scald these seeds, and some go to the extent of filing a hole in the shell in order to assist germination, but I have not found these processes necessary. When the seed-pans are placed in a warm house and plenty of moisture is given them I have lost but a small percentage of seeds. I have also tried soaking the seeds of various Palms for twenty-four to forty-eight hours before sowing, but have been unable to prove that much time can thus be saved in the period of germination.

The chief essential in the raising of Palms from seed is a moderately high temperature and fresh seeds, and little difficulty will then be found in inducing most species to germinate, though the time necessary for this varies greatly with different species. For instance, I have had seeds of *Livistona chinensis* germinate in ten days, and I also have now some seeds of *Attalea Cohune*, the *Cohune Palm*, that have been planted for two and a half years, and, though perfectly sound, they show no sign of germination. These are, however, among the extreme cases, though some of the *Kentias* are also slow, the irregularity of their transmission from their native land probably having something to do with the variations in the time of growing, and it is very likely also that some of the seeds are not perfectly matured when gathered. Of course, the operation of raising Palms from seeds is an interesting one, either for the amateur cultivator or for the professional, but it is well to remember that the retail buyer of Palm-seeds may not be able to secure as fresh stock as the large commercial grower, and consequently he may not secure so good a result.

The cleaning of any insect-infested plants should receive attention before the spring potting is done, so that the plants will be in condition to go forward; this precaution is especially

applicable to Palms. Fumigation with tobacco-stems is the best preventive for green-fly and thrips, and should be applied at regular intervals.

Holmesburg, Pa.

W. H. Taplin.

Begonias.

AMONG the numerous new Begonias of the shrubby section introduced recently, the crosses between *B. Olbia* and *B. rubra* seem especially striking, handsome and useful. *Souvenir de F. Gaulain*, *President Carnot* and *Bismarcki* are somewhat similar in general effect, the former having the darkest flowers and the latter the lightest. The leaves are long, finely notched and satiny, emerald-green above and reddish beneath. While similar in general effect, they have marked distinctive qualities. *President Carnot* is especially attractive, the upper part of the leaves being suffused with a reddish bloom, which has a very handsome effect. The flowers of all the varieties are large and borne in profusion. They are rather tall-growing subjects, but the limited space at my disposal will not allow me to let them grow to ascertain whether they possess the vigor of *B. rubra*. Apparently, they would be intermediate in size between the parents if well grown.

Hybrids and seedlings of *B. metallica* do not seem any great improvement on the parent as far as tried. *B. metallica* is one of the best of foliage-plants, free-growing, with a distinct character in its well-marked veins. The hybrids all have a weakly pallid look from absence of the strong veinings, and do not seem to have gained in freedom of flowering. These remarks especially apply to *B. cuprea* and *B. velutina*, which are seedlings. *B. pictavensis*, one of the new hybrids (with *B. Scharfiana*), is rather better, but does not, to me, seem as attractive as the latter parent.

In the tuberous section the most important offering this year is a new fragrant species, *B. fulgens*, by the Messrs. Lemoine. As tuberous Begonias are invaluable for greenhouse decoration in summer, the infusion of a distinct fragrance to the present hybrids will be a great gain. There seems a premonition of a great boom in hybrid tuberous Begonias this year for bedding purposes. Certainly they have their uses for that purpose, and well-selected kinds, started in a cool place and brought on slowly, average very well as out-of-door flowers if carefully staked and given proper attention. I think, however, that no one who has grown them largely will consider them a satisfactory bedding plant in the same sense that the Geraniums are satisfactory—that is, as always reliable growers, producing a maximum of effect with a minimum of care. Even the sturdiest of them require staking, as the hold of the shoots on the bulbs is of the slightest, so that a wind will twist them off, and the black rust, or some fungus, is very partial to the shoots in certain conditions of the soil. If bedding effects are attempted, reserve plants should be grown to replace losses. As wet-weather flowers they are certainly superb, remaining in perfect condition after rains which entirely wash out ordinary flowers. To those not addicted to the bedding-habit, and who are not quite satisfied with mere big flowers, may be commended the tuberous species, which, without exception, are all charming, each with character peculiar to itself. It is singular that, as a race, tuberous Begonias are free from objectionable colors. Only when crossed with *B. Socotrana* have I noticed any magentas; but this color is, I think, never found among the summer-flowering kinds.

Elizabeth, N. J.

J. N. Gerard.

Winter-flowering Aquatics.

WATER-LILIES are naturally summer-flowering plants, but it is no longer a matter of question that their loveliness may be enjoyed in the depth of winter. I have never been without flowers of Water-lilies of some varieties since the closing of the season for them out-of-doors; and in the greenhouses at Prospect Park, Brooklyn, many beautiful flowers were to be seen at Christmas-time and into the new year. As it is the aim of the managers, however, to have flowers for the summer decoration of the park lakes, the temperature of the houses where the Water-lilies are now placed has been lowered to induce rest, otherwise they would have kept on blooming, and as it is, there are yet flowers, though fewer in number and smaller in size. An amateur in the vicinity of the park has a unique water-garden where tropical *Nymphæas* are always in bloom, and other aquatics are seen in summer luxuriance. These tropical varieties of *Nymphæa* are the ones suitable for winter-flowering, and plants which have been grown in tubs or tanks out-of-doors will continue to bloom through the winter months if placed in water where the temperature does not fall below sixty-five degrees. In the stove-

house but little pipe is needed in a tank to keep it at a temperature of seventy degrees. The difficulty I have experienced with heated tanks is that they become too warm. Plants of the Zanzibar Water-lily, of the blue Lotus of the Nile (*Nymphæa cœrulea*) and of *N. scutifolia* will do well in tubs where tanks cannot be provided, but, of course, the latter are preferable where space can be secured.

An essential point in the cultivation of Water-lilies in winter is to get all possible light and sunshine. A tank from twelve to fifteen inches deep will suffice for planting out winter-blooming Lilies. These should be specially selected—that is, they should be either seedlings of the type of *Nymphæa Zanzibarensis* or of plants somewhat retarded during the early part of the season. The night-blooming varieties will flower well and remain open a great part of the day. A tank eight feet wide and eighteen inches deep would require, perhaps, a two-inch pipe, although I find a one-inch pipe too large in a tank sixteen feet long, four feet wide and eight inches deep. Eighteen inches would be deep enough for immersing tubs. The soil used should be thoroughly rotted manure and rich loam, as has been recommended for outdoor planting. So far as I have observed, Water-lilies are quite as fragrant in winter as in summer, although in winter the blooms may be smaller where they do not enjoy the most favorable conditions.

Aponogeton distachyon is another useful winter-flowering water-plant which will bloom freely in an ordinary greenhouse. Another is *Pistea stratiotes*, a pretty floating plant, with light green woolly foliage, which is always attractive. *Richardias*, or, as they are commonly called, *Callas*, can be associated with other aquatics, and their flowers give a charming effect to the water-garden in winter. *Azolla Caroliniana* (Floating Moss) is an interesting plant, and so is the Water Hyacinth and the Parrot's Feather (*Myriophyllum*), but they are better in greenhouse temperature, to check too rank a growth. *Cyperus alternifolius* is useful in connection with flowering aquatic plants, very ornamental anywhere, and good for cutting purposes. The Egyptian Papyrus, too, is a most graceful plant for greenhouse decoration, and should never be omitted from the winter water-garden.

Where there is space for groups of ornamental foliage-plants like Palms, Cordylines, Crotons, *Dracænas*, *Marantas*, etc., a delightful background can be made in winter, especially for a tank of irregular outline on the ground level or slightly raised above it. This, however, needs a large house, so as to afford ample light, say, sixty by twenty-five feet, and larger. Of course, there is no end to arrangements which can be made with these and other plants with decorative foliage, while Ferns and other low-growing things can be used on the water's margin or to carpet the naked ground.

Dongan Hills, N. Y.

Wm. Tricker.

Citrus trifoliata as a Hedge-plant.

THE proved hardiness of this plant, even in the north-west, makes it certain that for the purposes of a defensive hedge it is more completely adapted than any plant yet introduced. Its dense and compact habit of growth and armament of long spike-like spines, pointing in every direction on the rigid branches, soon make it impenetrable even by the tough-skinned razor-back hog of the south, to which a barbed wire fence affords a pleasant irritation. In reply to a letter concerning this plant, Mr. P. J. Berckmans, of Augusta, says: "I have fruited *Limonium trifoliatum* (?) nearly ten years, having introduced the first plant from Japan in 1873, and have grown yearly since a large stock of it. I have also a hedge of it nearly half a mile long. We have advertised it as a hedge-plant for several years past, but have been unable to raise enough to fill the demand so far, owing to the scarcity of seed." Mentioning this to a friend to-day, he remarked that Florida ought now to be able to furnish all the seed needed, and he added that twelve to fifteen bushels of these little oranges went to waste on his place at Lake City last autumn, and if the proper effort was made any quantity of the seed could be had in Florida.

The fact that this plant is a member of the *Citrus* family has deterred many people at the north from making experiments with it, but wherever planted I have so far heard of no injury to it from cold, and if the experiment stations in all the northern states would test it thoroughly the degree of cold it can endure may soon be determined. In my own experience ten years ago a temperature of eighteen degrees below zero at night, and four degrees below at noon, with bright sunshine, did not injure young plants in the slightest degree. The compact and dwarfish habit of the plant will make a hedge of it much more easy to keep in shape than the rank and unruly *Maclura*, and the ornamental character of its sweet flowers,

and the profusion of its golden fruit in October, will render a hedge of it very attractive. As a single specimen on a lawn it is an object of rare beauty.

Raleigh, N. C.

W. F. Massey.

[*Citrus trifoliata* produces flowers and fruit in sheltered positions in the neighborhood of this city; but it is not sufficiently hardy in the northern Atlantic states to be used successfully as a hedge-plant. In New England it is generally cut to the ground every winter, and does not flower. It would be interesting to know in what part of the north-west its hardiness has been proved.—Ed.]

The Pin Oak (*Quercus palustris*) abounds here in its wild state, and, whether wild or planted, it commands universal admiration. The downward tendency of the lower tiers of branches and the finely divided, shining green leaves give it a distinct appearance among other Oaks, and its rapid growth should commend it to all planters. One reason why the various Maples are so largely used is that they can be transplanted easily and successfully. It ought to be more generally known that the Pin Oak may be transplanted with just as much safety as the Maple. I have seen long avenues planted with good-sized Pin Oaks without the loss of a single tree. Those familiar with the roots of various Oaks know how this species differs from most other Oaks in this particular. The Pin Oaks have a mass of fibrous roots instead of the few prong-like roots of most other kinds. Practical planters make all Oaks live by pruning them judiciously. The Pin Oak has the advantage of needing but very little pruning, because its numerous roots will carry it through even if the branches are not shortened in.

Germantown, Pa.

Joseph Meehan.

Correspondence.

The Senecios of the Canary Isles.

To the Editor of GARDEN AND FOREST:

Sir,—I notice with pleasure in Number 192 of your journal that Mr. Watson invites attention to the long-neglected Senecios of the Canary Islands. In the spring of 1884 I had the opportunity of admiring these charming flowers growing at the feet of ancient Laurels in the gorges of the Canaries. This archipelago is the true home of that class of Cinerarias or Senecios, for which Webb proposed the new generic name, *Pericallis*.

In my *Specilegium Canariense* (see *Engle's Botanisches Jahrbücher*, 1887) I have enumerated half a score of different forms, but the principal types of interest to us now are the following:

1. *Senecio appendicularis* (syn. *S. populifolius*) is distinguished by its leaves, which are deep green above and of a cottony white color beneath, and resemble altogether the leaves of the White Poplar. The corymbs are very dense, and the flowers almost always white.

2. *S. Heratieri* is a slender plant, almost rampant, with few-flowered, often one-flowered corymbs, but with large, bright rose-colored flowers. This is a plant of the mountain of Teneriffe, growing at an elevation of about 6,000 feet, and never attaining the slender, many-flowered habit shown in the figure on page 509 in the above-mentioned number. It is a plant long cultivated, but its native land is not, as Mr. Watson states, the island of Madeira. It is peculiar to Teneriffe. The only plant of this group found on Madeira (see the excellent catalogue of the plants of Madeira by Monsieur E. Casson in the *Bull. Soc. France*, 1868) is the *S. Maderansis*, which is akin to *S. appendicularis*, but still differs considerably from that species.

3. *S. Tussilaginus* is very common in shady places on the Canary Islands; it is slender, with firm branches and very large leaves, and spreading corymbs composed of bright rose-colored flowers. This plant is probably the parent of our cultivated Cinerarias and of numerous varieties. The wild type is very inconspicuous as compared with our greenhouse Cinerarias.

4. *S. papyraceus* is confined to the bay-woods of the Ile de Palma, and is a very remarkable species, two feet to two feet and a half high, with superb, dark, shining foliage, and irregular corymbs composed of about a hundred flower-heads of a brilliant rose-carmine color. One must see this truly admirable plant in order to realize how the resplendent flowers glow like fire in the deep, sombre shadows of Canarian trees like the *Phœbe Barbrisana* and *Oreodaphne fœtans*. The plant, through its great beauty, has become the favorite flower

of the inhabitants. Every child of Palma knows it by the name *Cima*, and in Spain one often hears this refrain:

Todas las flores se crian en Mayo
Menos la *Cima* que no se hallo.

This effective plant would be an acquisition, and it would ripen its seeds readily in our cool greenhouses.

5. *S. cruentus* is the loveliest of all the gems of this beautiful genus. I could hardly express my pleasure and surprise when I first noticed at a distance this superb plant at the foot of old Perseas, above La Florida, at an altitude of more than 5,000 feet. It is quite slender, fifteen to eighteen inches high, with large radical, reniform leaves of a clear purple tint. Branches, leaves and all, even the hairy down of the leaves, were of this color. It is altogether unique in its way, glittering like a flame, and visible at a considerable distance. The flowers have the same color, disposed in irregular corymbs, which are small for the genus. This is a plant whose vegetative parts have assumed a pure luminous color which properly belongs to the corolla only. What a welcome would it receive in our gardens if it would always retain this color when raised from seeds. But the seeds which germinated with me at Bâle produced both green and red plants, quite different from their mother-plants. For all that, I do not doubt that by a careful selection it is possible to obtain and maintain the beautiful race that exists on Teneriffe; it is a plant by the side of which *Lobelia cardinalis* seems really dull and insignificant.

I am sure that nothing could be more interesting and meritorious than the propagation by means of seeds of these admirable Senecios in your gardens. In the southern states, in Carolina, in Georgia, I am sure that they could live in the open air, for on Teneriffe they are found at an altitude where it is quite cold during the winter. There is nothing easier than to obtain the seeds through the numerous inhabitants that take interest in the flowers of their charming country.

I mention only Mr. Wildpret, the gardener of a beautiful garden of acclimatization in Orataba, W. Teneriffe, and Dr. Perez, of the same place. I may add that just as Madeira has only one species of these plants, the Azores also possess one species in the very pretty *S. malvæfolius*, a rather large plant with rich corymbs of bright crimson-colored flowers, which I received through the kindness of Dr. Bruno Carreira, of Ponta Delgada, on the isle of St. Michel.

The botanists who read this little article, the object of which is to draw the attention to a series of plants, charming, but much neglected, will find a complete enumeration of all the forms and species in my *Specilegium Canariense*, pages 147 to 149.

We may venture to hope that, through the introduction of natural forms of Senecio, we shall be able to obtain new and remarkable hybrids to enrich the list of varieties that already exist in our gardens. *S. appendicularis* is capable of producing astonishing results, as its beautiful leaves are much whiter beneath than those of any other plant I am acquainted with.

Bâle.

H. Christ.

Plants for the Sea-shore.

To the Editor of GARDEN AND FOREST:

Sir,—With the ever-increasing summer exodus of sea-lovers comes a demand at the different resorts, each succeeding season, for more pleasant and varied surroundings. In planting to any large extent along a shore large consideration must be had for plants which have survived and flourished among such unpropitious surroundings. In early August I made a few observations on the flora of Barnegat Peninsula, and I hope a record of them may invite attention to some of our plants which flourish in sand, and in salt-laden breezes.

Barnegat Peninsula, a strip of shifting beach, from a quarter to half a mile wide, extending from Bayhead, New Jersey, to Barnegat Inlet, is evidently of bar-formation. The long sandy barrier grew in early times, and Barnegat Bay was closed off from the ocean. It was instructive to observe the efforts of Nature to clothe the sterile landscape with vegetation. The final attempt seemed to have been made here under conditions very unfavorable to vegetal growth. The salt-grasses and salt-water sedges apparently appeared first, preparing the way for the reception of species more fastidious. Some few plants seemed peculiarly adapted to such a hard fare. The Bayberry, or Waxberry (*Myrica cerifera*), was singularly attractive. It formed dense thickets, inhabited by the mosquito and the shy cotton-tail rabbit. The leaves, when rubbed, were aromatic, and the tough stems and twigs were covered with waxy grayish white berries, which make the plant valuable for ornamental uses on the sea-shore. The

berries are gathered at times by the plain fisher-folk here, and boiled over a slow fire. The wax rises to the top, and is then skimmed off and cooled into the required form. Candles of bayberry were no infrequent commodity in rural communities during Revolutionary days.

The Poison Dogwood (*Rhus venenata*) disputes the ground with the Bayberry. Dense masses of this poisonous shrub were seen everywhere, bearing compact panicles of yellowish white unripe berries, while over the exposed sand-dunes trailed the much-dreaded Poison Ivy (*R. Toxicodendron*). The dark glossy pinnate leaves of the former turn to the most vivid and attractive hues, and are much collected and admired for their autumnal coloring. *R. venenata*, with white berries and conspicuous autumn foliage, however, is exceedingly dangerous and virulent. Notwithstanding the bad reputation of the two plants, they are important as conservatives in nature. The drifting sand is anchored; skurries of sand are prevented, and an otherwise inhospitable neighborhood is made inhabitable. Once familiar with the Sumachs, and remembering that those species only are poisonous which have white berries, one can go into the woods with impunity and collect anything herbaceous, shrubby or arborescent without fear.

Rosa lucida grew also in this sea-shore tangle, and the half-ripe hips, tinged orange, glistened in the sunlight. Associated with these species, twisted into fantastic shapes by the wintry storms, and scrawny for want of sufficient nourishment, stood the cosmopolitan Red Cedar (*Juniperus Virginiana*). Some botanists hazard the opinion that the Bermuda Cedar is only a geographical variety of the Savin of North America. It is recorded in GARDEN AND FOREST (vol. iv., p. 290) that a tract of ground in the Bermudas is covered with Bermuda Cedars of large size, springing from a dense undergrowth of Wax Myrtle or *Myrica*, identical with the species so common on our Atlantic seaboard, and of *Baccharis*, similar to, although distinct from, our seaboard species, and of *Pteris aquilina*. I found the Red Cedar on Barnegat Peninsula, with the Wax Myrtle, with *Baccharis halimifolia* and with the Bracken (*Pteris aquilina*). It seems, therefore, that the two Cedars keep the same company at least.

With this impenetrable jungle as a background, and almost buried in the salt-water sedges and grasses, the Rose Mallow (*Hibiscus Moscheutos*) covered the meadows and more elevated hummocks with brilliant pink flowers, while Golden-rods and *Sabbatias*, in close masses, occupied the foreground. The landscape, so desolate and depressing, was thus transformed into a large unkempt garden, flavored by the salt of the ocean. For those who wish to see some vegetation as a relief from the everlasting glitter of sand and water, these native settlers offer more than a hint for the proper making of a planting list.

Philadelphia, Pa.

J. W. Harshberger.

Chamæcyparis squarrosa.

To the Editor of GARDEN AND FOREST:

Sir,—Last autumn I saw in Kew Gardens a small tree with beautiful feathery, bluish gray leaves, labeled "*Chamæcyparis squarrosa*." I do not find this particular variety of *Chamæcyparis* in the books or catalogues. Is it obtainable from nurseries here? Many evergreens fail with me on exposed hills of Staten Island, and I should like to know if this one would probably prove hardy?

Staten Island.

J. M. N.

[This plant, which is an abnormal form of the well-known Japanese *Chamæcyparis obtusa*, is usually met with in nurseries, where it is now common, as *Retinospora squarrosa*. It is a rather freer-growing plant and quite as hardy as the other forms of the Japanese *Chamæcyparis* or *Retinospora*.—Ed.]

Recent Publications.

Preliminary Report on the Native Trees and Shrubs of Nebraska. By C. E. Bessey. Bulletin of the Agricultural Experiment Station of Nebraska, vol. iv., article iv.

The territory embraced in the state of Nebraska is, with reference to its native silva, one of the most interesting portions of the United States, occupying as it does a mid-continental position between the two great natural forest-regions of the east and the west. A considerable number of the species of the forests of the Atlantic seaboard extend to the eastern confines of the state, while others descending from the slopes of the Rocky Mountains reach the eastern limits of their distribution within its borders.

The list prepared by Professor Bessey contains no less than sixty-one native arborescent species, a surprisingly large number when it is remembered that, apart from the Cottonwood and Willow-lined streams, the woods are confined to the extreme eastern and the extreme western borders of the state, the central, and by far the larger part, being treeless.

From carefully prepared tables of the distribution of the different species at different elevations, and in different parts of the state, Professor Bessey reaches the conclusion that "nearly all have probably migrated to the plains from the east," and that many of them have not "done more than to get a little foothold in the extreme south-eastern counties, to which they have come from the heavy forests of Missouri. A few have doubtless crossed the Missouri River from western Iowa, although this number is evidently very small. Nearly all our trees have come up the Missouri bottoms and spread from the south-eastern corner west and north-west. Possibly a few have come up the Blue River from Kansas, but these must eventually be traced to the Missouri River bottoms at the mouth of the Kansas River." Of the plants which have traveled from the west the Buffalo Berry (*Shepherdia argentea*) appears to be the only one that has spread over the entire state; although the western Shadbush (*Amelanchier alnifolia*), a denizen of a considerable portion of western America, is found as far east as the shores of the Great Lakes. But the number of western trees and shrubs now found within the state is certainly small, considering the facilities for their transport, and, as Professor Bessey suggests, "it is singular that so few of the western plants have come down the streams, especially as prevailing winds are also from the westerly parts toward the east," and it would have appeared "much easier for the western trees to come down-stream, and with the wind, than for the Elms, Ashes, Plums, etc., to have gone up the streams against the prevailing winds." But this is explained by the supposition "that eastern conditions are slowly advancing westward; and that such climatic and other changes are slowly taking place upon the plains as favor the eastern rather than the western trees," which now appear to be slowly retreating, while eastern species are slowly pushing their way westward.

The results of Professor Bessey's investigation are of particular interest and value in the new light which they give upon the distribution of several of our trees. A comparison of his paper with the ninth volume of the *Final Reports of the Tenth Census*, in which all the information available ten years ago about the distribution of the trees of North America was supposed to have been collected, shows that the range of not less than twenty-two Nebraska trees was inaccurately given in that work. *Pinus ponderosa*, which was then believed not to grow naturally farther east than the Black Hills of Dakota, is now known, as Professor Bessey has pointed out in an earlier publication, to extend along the Niobrara River to Long Pine Creek, in Brown and Rock counties; it also occurs on the North Platte as far eastward as Deuel County and in the valley of the Loup in Valley, Greeley and Custer counties. It grows at the highest elevations in the state, ranging from over 5,000 to about 7,000 feet above the level of the ocean. Fine trees are still abundant upon the slopes and summits of rocky hills in the northern and north-western portions of the state, although the best and most accessible of the Nebraska pine has already fallen to supply the wants of the settlers.

The White Oak (*Quercus alba*), believed to have been arrested on the west by the Nodaway River, in Missouri, is now shown to reach Cass and Nemaha counties, in south-eastern Nebraska, where also occur the Red Oak (*Q. rubra*) and the Scarlet Oak (*Q. coccinea*), whose western range was not supposed to extend farther than western Iowa. The Ironwood, or Hop Hornbeam (*Ostrya Virginiana*), Professor Bessey has found in several of the eastern and northern counties, although eastern Iowa was given in the Census Report as the limit of its range westward. The fact that the Canoe Birch (*Betula papyrifera*), the Western Birch (*B. occidentalis*) and the River Birch (*B. nigra*), all occur in Nebraska, is for the first time shown in Professor Bessey's catalogue, in which are included the Butternut (*Juglans cinerea*), the Shellbark Hickory (*Hicoria ovata*), the Big Shellbark (*H. sulcata*), none of which were credited to Nebraska in the Census Report. The number of Poplars is increased by the discovery that the Aspen (*Populus tremuloides*), one of the few trees which occur on the two sides of the continent, extends as far south as Nebraska, where it has been noticed in the north-western and in the south-eastern counties, and that the narrow-leaved Rocky Mountain Poplar (*P. angustifolia*), not known before east of the Black Hill region in Dakota, really reaches Nebraska. The Papaw (*Asimina triloba*) and the Dwarf Sumach (*Rhus*

copallina) are found to grow in the extreme south-eastern part of the state, and the Little Rocky Mountain Maple (*Acer glabrum*) in Sioux County, in the north-west. The Sugar Maple (*A. barbatum*) and the Red Maple (*A. rubrum*), which were credited to eastern Nebraska in the Census Report, are now said not to grow naturally in any part of the state, although it seems probable that the second of these trees may yet be found near the borders of some of the streams which flow through the south-eastern counties into the Mississippi. Other additions to the Nebraska silva are the Witch Hazel (*Hamamelis Virginiana*), the Indian Cherry (*Rhamnus Caroliniana*), the Mountain Mahogany (*Cercocarpus parvifolius*), a widely distributed Pacific species, the Western Choke Cherry (*Prunus demissa*), the Sheepberry (*Viburnum Lentago*), and the Red Ash (*Fraxinus pubescens*).

These facts show the importance of Professor Bessey's investigation, and how much there is still to be learned about even such an apparently simple matter as the distribution of some of our most common and best-known trees. They show in particular the necessity of a careful study of the vegetation of the mid-continental region, in which are mingled plants of the east and of the west, and in which many eastern species finally disappear, and a few western species find the eastern limit of their distribution. Professor Bessey's report suggests that there is still much to be learned of the distribution of trees in the two Dakotas, in Kansas, in the Indian Territory and in Texas; and it is to be hoped that botanists living in those states, and with facilities for collecting facts about their vegetation, will follow the example of the Professor of Botany of the University of Nebraska, and make public the results of their observations.

Much remains, too, still to learn of the distribution eastward, in Idaho and Montana, of several trees of the north-west coast, and of the northern and eastern distribution of the trees of British Columbia, whose silva, in spite of the good field-work and excellent reports of Dr. Dawson and Professor Macoun, is still very imperfectly known.

Electricity in Agriculture is the title of bulletin No. 16, lately prepared by Mr. Clarence D. Warner, Meteorologist of the Massachusetts Agricultural College Experiment Station. In vol. ii., p. 442, we published the results of some experiments made at Cornell University which seemed to strengthen the opinion that electric light might be of advantage in some branches of horticulture. The experiments in Massachusetts, however, have nothing to do with light, but they are an attempt to show that electric currents passing through the ground and atmosphere have some influence on vegetation. As this is the first of a series of bulletins, it includes a brief résumé of what has been done by former experimenters, and Mr. Warner prefaces this historical sketch by the statement that the currents of sap which are carried through the rootlets, stalk and leaves of the plant depositing the elements of plant-food in their proper places are due to electricity, a theory which can hardly be considered as established. He adds, that since the plant at night is generally covered with dew it becomes a good conductor for electrical currents, which convert in their passage soil elements into plant-food and stimulate the sap to gather up the dissolved elements and carry them to their proper places. He thinks it probable, therefore, that this accounts for the fact why most plants grow more rapidly during the night than during the day.

The history given of the earlier experiments is briefly this: In 1845 plates of copper and zinc were placed in the soil where plants were growing and connected by a wire, but these efforts were fruitless of results. In 1847 Hubeck, in Germany, surrounded a field with a network of wires, and concluded that seeds germinated more rapidly and buckwheat gave larger returns. In all other cases electricity produced no result. Other men of science carried on experiments with negative results, and the abandonment of the project of applying electricity to agriculture was advised. Some years later Fichtner used a battery with effect. Parallel wires were placed in the soil, and between the wires Peas, Grass and Barley showed an increase of from thirteen to twenty-seven per cent. when compared with ordinary modes of cultivation. Fischer, of Waldheim, placed metallic supports to the number of sixty around each hectare (about two acres and a half), and at the summit of the supports were electrical accumulators in the form of crowns surmounted by teeth, which were united by metallic connection. The result appeared to increase the crop of cereals by one-half. Plates of zinc and copper, alternately placed about a hundred feet apart and connected two and two by a wire, were said to increase twofold to fourfold the production of certain garden-plants. Fischer stated that it was

proved that electricity aided in breaking up the soil constituents, and he stated that plants under this treatment matured more rapidly, were more healthy and were not affected by fungoid growth. In later experiments by Specnew, seeds were submitted to the action of an electric current, with the result of hastening germination and better-developed young plants than those grown from non-electrified seeds. The current did not affect the yield. At Kew Gardens plates of copper and zinc were placed in the soil so as to make a battery of zinc, earth and copper, with the result of increasing the crops of vegetables. Other experiments made in Pskov, in Russia, at the School of Forestry in Nancy, France, and other places, seemed to indicate that an electrical current could be profitably employed in not only garden and field crops, but that Grape-vines subjected to this treatment yielded fruit with a larger percentage of water and sugar and a lower percentage of undesirable acid.

The following experiments were made in the greenhouse at Amherst: Rectangular frames were made three feet long by two feet wide, across which were run copper wires in series of from four to nine strands, each series separated by a space of four inches, and the strands by a space of half an inch. The frames were buried in the soil so that the roots of the plants would come in contact with the wires, with the supposition that the currents of electricity passing through the wires would decompose into its constituents the plant-food near the roots and prepare it for the plants. Two electric gardens were thus prepared and furnished with a battery arranged to allow continuous currents through each series of wires. Near each electric garden was a plot prepared in the same way, except that it lacked the electrical apparatus. These gardens are designated as *A* and *B*. The soil was carefully prepared for Lettuce, and were placed where much trouble from mildew had been experienced, in order to test the effect of electricity upon the fungus. In garden *A* fifteen Lettuce-plants of the same size and vigor were set over the wires, the plants well cared for and the current kept continuous. The experiment began the 1st of January, and on the 1st of April five of the plants had died from mildew; the others were well-developed and the heads large. The largest heads were over the greatest number of wires and nearest the electrodes. It appeared that the healthiest plants as soon as the currents became feeble or ceased would be affected by mildew. On examining the roots of the plants it was found that they had grown about the wires, as if they found there the greatest amount of nourishment. The roots appeared in no way injured by the current, but rather benefited by the electrical influences. Beside this garden was one of the same dimensions, used as a check, having the same kind of soil, and treated in the same manner as the first, except that the electrical apparatus was wanting. At the close of the experiments only three plants had partially developed; two of these were nearly destroyed by mildew, and only one of these was free from disease. In the second garden, *B*, twenty plants of the same variety of Lettuce and equal size were taken and treated the same as in *A*. At the close of the test only five plants were free from mildew, seven died before they were half-grown, the rest were well-developed, but in the last part of the experiment they began to be affected. Several heads were large, the largest being over the greatest number of wires and nearest the electrodes. Near this plot were twenty other plants subjected to like conditions, but without electricity; all but one died from mildew before they were half-grown. The solitary survivor only developed partly at the close of the experiment, and was badly affected with the disease. The general result was that the plants subjected to the greatest electrical influences were hardier, healthier, larger, had better color, and were less affected by mildew than the others. Experiments were made with various Grasses, but no marked results were obtained.

Mr. Warner concludes: "It would seem that electricity is one of the agents employed by nature to aid in supplying the plant with nourishment and to stimulate its growth. To what extent plants may be subjected to electrical influences, or what strength of current is best suited, and what currents may prove detrimental to their development have not been determined, but it is desirable to continue this research until some definite information shall be gained on these points. Experiment alone can determine whether different varieties of plants differ in their capacity for enduring the action of electrical currents without injury." Mr. Warner also suggests that there may be a limit reached where electricity would completely overcome the attack of mildew and stimulate plants to a healthy and vigorous condition throughout their entire growth. We may add that if electricity is so potent in giving vigor to Lettuce it might under certain conditions give equal vigor to the mildew

and other parasitic plants. We shall look with interest to further reports on this matter, and trust that they may be carried on in the true scientific spirit, and without any attempt to establish previously formed judgments.

Notes.

At the last meeting of the Massachusetts Horticultural Society the Honorable Ephraim W. Bull, of Concord, was made an honorary member of the society. This was a well-merited, though somewhat tardy, compliment to Mr. Bull for his distinguished services as the originator of the Concord Grape.

The Executive Committee of the American Carnation Society announces that its first annual meeting will be held at the Tift House, Buffalo, New York, on the 16th of February. There will be an exhibition of flowers of the older and newer varieties, and many interesting papers on the Carnation, its diseases, its history and its cultivation.

A recent writer, in speaking of the town of Walmer, in Cape Colony, says that the Christmas decorations in its little church were the most beautiful she had ever seen. They consisted simply of magnificent blue Water-lilies and the large pure-white Arums, which the colonists unpoetically call "Pig-lilies," combined with the glossy foliage of the Arums and a few great Fern-fronds.

The fruit crop of last year in Iowa was unusually good, and the fruit-growers there feel much encouraged in spite of the suffering of this industry from severe winters in recent years. The display of apples at the meeting of the State Horticultural Society last week was remarkable for its size and quality. The society resolved to do everything in its power to make a creditable collection of Iowa fruits for the Columbian Exposition next year, and the Hon. C. L. Watrous, of Des Moines, was selected to superintend the work.

The most enthusiastic followers of the art of floral arrangement in Japan, we are told, are priests, philosophers and men of rank who have retired from public life. It has always been regarded as a fitting occupation for learned and literary men, and not at all as an effeminate accomplishment, although ladies of the aristocracy practice it as they do the other arts. Some of the virtues which are said to spring from an habitual practice of this charming art are "the religious spirit, self-denial, gentleness and forgetfulness of cares."

In a recent bulletin of the Michigan Experiment Station a record is made of the test of the value of the practice of transplanting Onion-seedlings. Seeds of several varieties were sown in a hot-bed on the 10th of April, and on the 16th the plants were transplanted to the field. Seeds of the same sort were on the same day sown in a parallel plat for comparison. The soil was rich sandy loam, and the same care was given to both tracts, with the result in every case in favor of the transplanted Onions. The variety known as Prize-taker yielded, when transplanted, 548 bushels to the acre, while those not transplanted yielded 216. The Rocca, transplanted, yielded 556 bushels against 110 when not transplanted, and Southport yielded 296 bushels against 172.

Professor Penhallow, of the McGill University, has reprinted from the *Canadian Record of Science* his papers on the *Flora of St. Helen's Island, Montreal*; and on the *Flora of Caconna, Province of Quebec*, a flora which he finds of especial interest from the fact that it contains several southern types obviously near or at the extreme northern limits of their distribution, and also many distinctively boreal species. The prevailing arboreal vegetation of Caconna Island, which in reality is not an island, but is connected with the mainland by a low neck of land not entirely submerged, even at high-water, is composed of the Black and White Spruces, the Red Pine and White Pine (this last very rare), the Larch and the *Arbor-vitæ*. The Sugar Maple, the Banksian Pine and the Aspen are common, and the Canadian Yew is often the most abundant undergrowth of the forest.

A new edition of Sir Joseph Hooker's *Himalayan Journals*, edited by G. T. Bettany, has just been added to the Minerva Library of Famous Books, published in London by Ward, Lock, Bowden & Co. This cheap edition of one of the best books of scientific travel ever written, which has long been out of print, will be a real boon to every student of science. The illustrations are printed from the original wood-cuts, and the present edition, in one volume, is identical with the first unabbreviated edition, except that some of the appendixes of lim-

ited general interest are omitted. The editor adds an interesting sketch of the author of the *Himalayan Journals*; these were published in 1854, and the author, now the most distinguished English botanist, is very nearly at the end of his task of describing the plants of India, for which he fitted himself in the long and dangerous journeys of which these *Journals* are the record.

The eleventh part, the last to reach us, of the American edition of the sumptuous *Lindenia*, or *Iconography of Orchids*, conducted by the Messrs. Linden, of Brussels, with the assistance of Em. Rodigas and R. A. Rolfe, contains portraits of *Cattleya* × *Hardyana*, var. *Laversinensis*, a supposed natural hybrid between *C. aurea* and a variety of *C. gigas*, imported several years ago from New Granada. The flowers are fragrant, with light rosy mauve sepals and petals, and a deeper-colored lip. Several forms of what are doubtless the same hybrid, differing slightly in the color and markings of the flowers, have appeared in different collections. The one which Monsieur Linden has selected for his beautiful plate first flowered in Baron Rothschild's gardens at Laversine, in France. The other figures in the number are of *Rodriguezia pubescens*, *Ærides suavissimum*, and *Disa grandiflora*, the magnificent terrestrial Orchid from South Africa, a now well-known plant, but hardly surpassed in the beauty and showiness of its flowers by any other Orchid. *Lindenia* is a store-house of information which cultivators of Orchids will find invaluable. The illustrations are not surpassed by those of any other work of the same character and scope.

In a paper prepared for the American Pomological Society, Professor W. F. Massey calls attention to the peculiar advantages of the mountain-region between the Blue Ridge and the Alleghany Ridges in western North Carolina for the cultivation of apples: "The wonderful capacity of these elevated valleys and mountain-slopes for the production of apples of a size, beauty and flavor unknown in the same varieties grown elsewhere, is rapidly coming to be acknowledged since the great displays made by this section at the Centennial Exposition and at the meeting of this society in Baltimore in 1877. The trees are larger, more vigorous and longer-lived than in most other places. In one orchard, in Haywood County, there are more than 100 trees averaging nine feet in circumference of trunk. Trees of this size are common in most of the mountain counties, and they are in the most luxuriant health. In the elevated valleys about Waynesville, in Haywood County, the Yellow Newtown Pippin grows to the same perfection as on the mountain-sides in Albemarle County, Virginia, where it is known as the Albemarle Pippin. In the summer of 1890 there was scarcely any fruit in all the country east of the Mississippi River and in all other parts of this state. In these mountains not only were the Apple-trees loaded with fruit, but Peach-trees were breaking down with their crop. That there are extensive belts on these mountain-sides where early autumnal and late vernal frosts are unknown, is a well-attested fact, and this renders the culture of fruit there more certain than in any other section of the eastern states."

In the Government report of crops for last year there are some valuable lessons as to the prices of farm-products. The crops were almost without exception large, and under such circumstances prices are always reduced. Singularly enough this decline in prices is often greater in proportion than the increase in production, so that the surplus depresses the total value of the crop. For example, in 1890 the supply of potatoes per capita was smaller than it had been for many years, and therefore the price per bushel ranged very high; nevertheless the inferior quality in most of the districts where production is the largest prevented farmers from securing the advantages of these high prices. Last year the crop was enormous and the acreage planted large, so that there has been a heavy decline in prices. This decline has been so serious that while the country produced 100,000,000 bushels more than it did the year before, the aggregate value of the crop is less than that of 1890 by \$20,000,000. On the other hand, the wheat crop was twenty per cent. greater in 1891 than in 1890, and yet the price per bushel slightly exceeds that of a year ago. The reason for this is that, although the crop is largely beyond the requirements of home consumption, there is an extraordinary demand for it abroad which has sustained the prices. The aggregate value of the present wheat crop is about \$179,000,000 greater than that of last year, and the enormous corn crop, in spite of the fact that it is twenty per cent. less per bushel than it was last year, is worth to farmers at December prices about \$80,000,000 more than the crop of 1890.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLES:—The January Thaw.....	49
The Aspect of Trees in Winter. (With figure.).....	50
The Proposed Forest-reservation in Northern Minnesota.....	50
Is Grafting a Devitalizing Process?—II..... <i>Professor L. H. Bailey.</i>	50
Notes on the Mid-winter Vegetation of Central Florida..... <i>A. N. Prentiss.</i>	52
NEW OR LITTLE-KNOWN PLANTS:—Smilax Pseudo-China. (With figure.)..... <i>C. S. S.</i>	52
FOREIGN CORRESPONDENCE:—London Letter..... <i>W. Watson.</i>	54
CULTURAL DEPARTMENT:—Ericas..... <i>N. J. Rose.</i>	55
The Value of Wind-breaks..... <i>E. P. Powell.</i>	56
Alternanthera Leaf-blight..... <i>Professor Byron D. Halsted.</i>	56
Galvanized Iron for Propagating-beds..... <i>Wm. C. Strong.</i>	57
Berberis Thunbergii..... <i>T. D. H.</i>	57
CORRESPONDENCE:—The Forests of Washington..... <i>Louise Herrick Wall.</i>	57
The Hardiness of certain Evergreens..... <i>Joseph Mehan.</i>	57
MEETINGS OF SOCIETIES:—The Western New York Horticultural Society.—I.....	58
Maintaining the Fertility of the Soil in Orchards..... <i>Professor I. P. Roberts.</i>	58
NOTES.....	59
ILLUSTRATIONS:—Smilax Pseudo-China, Fig. 10.....	53
A Branch of the Black Oak (<i>Quercus tinctoria</i>), Fig. 11.....	55

The January Thaw.

WITH hardly frost enough preceding to excuse it, the January thaw made its appearance early in the new year to add its terrors of melting snow and heavy atmosphere to the already unhealthy season.

This freak of nature is detestable enough in towns, where there is some slight mitigation of its evils by the intervention of sidewalks, with their attendant shovels and brooms. Though the dripping roofs, the reeking gutters, the slippery pavements, the muddy crossings, make the pedestrian's career precarious enough, the most disagreeable of city thaws does not begin to interfere with domestic comfort, or impede locomotion, as a similar infliction does in the rural districts, where roads and paths become well-nigh impassable with mud and slush.

That part of this annoyance might be avoided by proper care on the part of the road commissioners is well known, but there is always a reluctance shown by towns to make the proper appropriations for the maintenance of the highways, which show all their defects in a thaw.

If all the low portions of these thoroughfares could be properly drained, and a good bed of stones provided beneath, the surface moisture would soon drain off, and leave a firm and reasonably dry surface for travel. The saving of expense in the long run, in the wear and tear of vehicles, and in the time of individuals, now wasted in slow endeavors to get from place to place through sloughs of mud, would well repay a large expenditure to properly prepare the roads in the beginning; but here the penny-wise and pound-foolish policy is apt to prevail, to the trial of horse-flesh and patience.

If any one will remark the difference between a gravelly road and a low undrained stretch of highway, he will promptly recognize the service that a porous understratum renders to the passenger. So soon as the sun thaws the snow the former gives a firm surface for travel, while the latter grows steadily worse as the dissolving snow-heaps pour their waters into the tank formed by the impervious soil. In the one case drying can only be effected by

evaporation, while in the other the moisture steals away by a million underground channels, which can be prepared for it by a foundation of broken stone. With the long-suffering of American communities trained to a make-shift policy, we put up with a state of things that was prevalent in England a hundred years ago, but which has been done away with there on the great lines of travel, as it could easily be done away with here by a resolute effort on the part of our townspeople at their annual meeting, when a different policy of managing the roads should be urged and generously sustained.

It is at this season of melting snow and lowering heavens that facilities of travel are most essential to the dweller in the rural districts, compelled as he is to the contemplation of a melancholy landscape, for if the country can ever be a sorry sight it is on one of those bedraggled days when the heavy gray sky comes down upon the sodden earth and envelops it in a dripping mantle. The picturesqueness of a veiled distance, apparent enough through a summer rain, has vanished, and only near objects are visible.

Big tear-drops hang from every joint of the vines on a veranda, as if the skeleton creepers were bemoaning this pitiable sight. Whatever is not mud-color or white in the landscape, is black. The trees have gone into mourning, the fence-rails are plunged in gloom. Near houses look dingy; more distant ones, if visible, shiver forlornly under their chilly trees. The evergreens themselves show a shabby winter raiment of rusty green, specked with brown. Not a snow-bird or a sparrow ventures abroad.

A heavy wagon at long intervals struggles through the mud, or a be-mired foot-passenger picks his dreary way among the puddles and stiff ridges left by the snow-plow in its travels. The very dogs and cats are housed, and cling to the warm fireside rather than venture abroad out-of-doors.

This is winter in undress, without his ermine robe and glittering crown of icicles, and a disreputable old monarch he shows himself when not in gala attire. To those who go forth to face him he gives but a chilling greeting. His sleety breath, his freezing mists, are enough to deter the stoutest-hearted member of the Appalachian Club. There is stimulus in a brisk snow-storm but a winter fog disheartens even the brave, who fear its "grip" even more than its cold embrace. Tremble as we may at nipping cold and icy blasts, we brace ourselves to meet them, and the blood flows more freely for the effort. It is the inert depression of the motionless mist that induces gloom, and against this man needs all his resolution.

Here must the mind act upon the shivering frame, and rouse it to combat with the outside enemy. For it is during these winter imprisonments that the dweller in the country finds time for study and reflection, for the free exercise of thought and the construction of plans for the future. Those influences which tend to throw the mind back upon itself are the real enhancers of intellectual growth. In the roar and hum of contact with human life, in the restless resounding of calls to active duty, the soul fails to catch the note of its own bell, which only in silence and solitude may vibrate with a clear tone.

So sensitive is the intelligence that it more often renders an echo than an original note, which gives us a consolation even for the limitation of facilities for locomotion, and even leads us to be grateful for those natural causes which, against our will, conspire to seclude us for a while to the benefit of our individual growth and to the strengthening of our own mental vibration.

Thus even a January thaw, with its neglected country roads, which prevent travel and interruptions, may serve as a needed refreshment to a jaded intellect by driving it to the true sources of development, meditation and recollection, for it is not so much bodily activity, nor the contact with others, that inspires original thought, as that communing with one's own soul in the stillness, from which the greatest results have ever been born.

The Aspect of Trees in Winter.

THE genuine lover of trees finds it difficult to decide at what season they are the most attractive. Even in the dreariest period of the year they display beauties which are hidden by the luxuriant foliage of summer, and it is only by a study of their naked framework that we can discern the reason for their most characteristic appearances at other seasons. One of the most distinctive aspects of a tree in summer is found in the way in which the masses of its foliage break into lights and shadows. A glance at an Oak or Chestnut in the winter will show that the trunks of these trees divide into a comparatively small number of large branches, which leave deep irregular openings for dark shadows in the foliage in strong contrast with the light on well-defined masses. The smoother surface of a vigorous young Sugar Maple in leaf shows smaller and more numerous tracts of light and shade, and this is caused, as can be readily seen in winter, by the more numerous and slender branches of nearly equal length which radiate at a uniform angle from the central stem. Again, the appearance of trees in summer is influenced greatly by the way in which the masses of foliage sway in the wind, and this movement depends on the length and flexibility of the branches. The skeleton of the tree, therefore, not only determines its contour, but it is this structure rather than the mantle of leaves which determines the fundamental expression of the tree, whether of majesty or grace, of cheerfulness or gloom.

We have often invited attention to the marvels of color and texture displayed by the bark of various trees, to the soft tints and varied grace of the spray of different species, and to the delicate tracery of their interlacing branches when seen against the sky. All these can best be seen in winter, and perhaps we are more attracted by beauty of this sort at a season when the fields have no verdure, and the waysides no flowers, to withdraw our attention. The more we study them the more we shall discover to excite admiration, and we may find something characteristic even in the smallest twig or the dead leaf which still clings to it. Gilpin long ago, in his delightful book on forest-scenery, showed that the English Oak develops naturally into its wide-spreading form because of the almost horizontal divergence of the young branches from the stem, and that this same rectangular structure which gives the tree its massive and sturdy appearance can be seen throughout the entire system of branches to the remotest spray. The picture of the extremity of a Black Oak-branch (*Quercus tinctoria*), on page 55, from one of the series of remarkable photographs with which Dr. Rollins has kindly favored us, might stand by itself as the type or emblem of a northern winter; and the persistency with which the dead leaves have clung, in spite of bitter winds, is a convincing proof of the tough and enduring fibre of the tree. On an Oak of this species which stands alone on some wind-swept upland many of the leaves by midwinter are torn like old banners, and their strong stems are twisted into bundles of yellow cords. When the leaves are finally swept away the ends of these fibres still cling to the spray and present a weird, blossom-like appearance, which reminds one of Witch Hazel flowers. All these will be seen beautifully brought out in the picture, together with the perfect form of the buds and the close texture of the bark.

FROM an article which appeared in the *Minneapolis Tribune*, of January 19th, it would seem that the leading opposers of the proposed forest-reservation in northern Minnesota have been converted from enemies into friends and have enlisted as promoters of the movement. The Duluth Chamber of Commerce stood in the front of the fight against the reservation, which, in the eyes of the merchants of that town, seemed to threaten its business by crippling the railways and withholding its supplies of lumber and minerals. Mr. Thompson, the Secretary of the

Chamber, was, therefore, sent to the annual meeting of the State Forestry Association, at Minneapolis, to make protest against the movement, but when he learned that instead of withholding the timber from use it was proposed to secure a constant lumber-supply, and that the forests, when protected from fire and larceny and skillfully managed, would be much more productive than it is under the present lack of supervision, Mr. Thompson himself joined the association, and was made a member of the executive committee, which is laboring to induce the President to make the proclamation withdrawing the timber-lands from sale and entry. If this reservation is established and placed under judicious control, it will doubtless prove a lasting benefit in many ways to the people of the United States.

Is Grafting a Devitalizing Process?—II.

WE herewith present the conclusion of the paper read by Professor L. H. Bailey before the Peninsula Horticultural Society. In the first part of the paper it was contended (1) that any number of examples of unsuccessful grafting do not prove that the practice itself is harmful, and (2) that it is a fallacy to assume that grafting is unnatural, and therefore pernicious.

3. It is said that own-rooted plants are better than foster-rooted ones. This is merely an assumption, and yet it has been held with dogmatic positiveness by many writers. If mere unnaturalness, that is, rarity or lack of occurrence in nature, is no proof of perniciousness, then this statement admits of argument just as much as any other proposition. And surely at this day we should test such statements by direct evidence rather than by a priori convictions. And here I will repeat that the citation of any number of instances of the ill effects of graft is no proof that own-rooted plants are necessarily better, if there should still remain cases in which no injurious effects follow. Now, if it is true that "own-rooted things are always infinitely better, healthier and longer-lived" than foster-rooted plants, and if "grafted plants of all kinds are open to all sorts of accidents and disaster," then the proposition must admit of most abundant proof. I will analyze the subject by discussing the following questions: *a.* Is the union always imperfect? *b.* Are grafted plants less virile than own-rooted ones? Are they shorter-lived?

a. It is well known that the physical union between cion and stock is often imperfect, and remains a point of weakness throughout the life of the plant. But this is not always true. There are scores of plants which make perfect physical unions with other plants of their own species, or even with other species, and it follows that these alone are the plants which should be grafted. The very strongest proof which can be adduced that the union may be physically perfect can be seen in the micro-photograph of an Apple-graft, published two years ago in the *American Garden* (xi., 65), by Professor C. S. Crandall. The cells are knit together so completely that it is impossible to determine the exact line of union. I have in my possession a number of the micro-photographs, taken by Mr. Crandall, which show the same condition. (These were exhibited at the convention.) Mr. Crandall also figures, on the same page, a microscopic section of an Apple-graft in which the union is very poor, but this graft was made in a different manner from the other, and presents another proof that the operation should be suited to the subject.

These were grafts made upon nursery stock, and it would appear that if the union were good at the expiration of the first year it would remain good throughout the life of the plant. In order to test this point, I procured two Apple-trees, fifteen years old and over six inches in diameter, which had been grafted at the surface of the ground in the nursery. In the presence of two critical observers I split the trunks into many pieces, but no mark whatever could be found of the old union. The grain was perfectly straight and bright through the crown. I am the more willing to cite this case because I had fully expected to find a decayed or dead portion, or contorted grain, at the point of union; but every internal evidence of a graft had disappeared.

So far as the strength of a good union is concerned, all fruit-growers know that trees rarely break where they are grafted. There is an old seedling orchard upon my father's farm into which many grafts had been set. I have myself set many hundreds of these grafts in the tops of the trees, often far out

on large limbs, and in the immediate neighborhood I have set many thousands under similar conditions; and yet, with all the breaking of the trees by ice, storms and loads of fruit, I have never known a well-established union to break away. And I have had the same experience with Cherries and Pears. I have lately tested the strength of the union in a different way. A few days ago I cut two "stubs" from an old and rather weak Apple-tree, which had been cleft-grafted in the spring of 1889. These stubs were sawed up into cross-sections less than an inch thick, and each section, therefore, had a portion of foreign wood grown into either side of it. These sections were now placed on a furnace and kept very hot for two days, in order to determine how they would check in seasoning, for it is evident that the checks occur at the weakest points. But in no case was there a check in the amalgamated tissue, showing that it was really an element of physical strength to the plant. A similar test was made with yearling Mulberry-grafts, and with similar results; and this case is particularly interesting, because there were three species intergrafted—the common Russian Mulberry, *Morus rubra* and *M. Japonica*.

From all these considerations it is evident that, admitting that hundreds of poor unions occur, there is no necessary reason why a graft should be a point of physical weakness, and that the statement that "grafted plants of all kinds are open to all sorts of accidents and disaster" is not true.

6. Are grafted plants less virile—that is, less strong, vigorous or hardy—than others? It is evident that a poor union or an uncongenial stock will make the resulting plant weak, and this is a further proof that indiscriminate grafting is to be discouraged. But these facts do not prove the affirmative of my question. There are two ways of approaching the general question—by philosophical considerations and by direct evidence. It is held by many persons that any asexual propagation is in the end devitalizing, since the legitimate method of propagation is by means of seeds. And this notion appears to have found confirmation in the conclusions of Darwin and his followers that the ultimate function of sex is to revitalize and strengthen the offspring by the union of the characters or powers of two parents; for if the expensive sexual propagation invigorates the type asexual propagation would seem to weaken it. It does not follow, however, that because sexual reproduction is good, asexual increase is bad, but rather that the one is, as a rule, better than the other, without saying that the other is injurious. We are not surprised to find, therefore, that some plants have been asexually propagated for centuries with apparently no decrease of vitality, although this fact does not prove that the plant might not have positively increased in virility if sexual propagation had been employed. The presumption is always in favor of sexual reproduction, a point which I suppose will be admitted by every one. And right here is where grafting has an enormous theoretical advantage over cutting or any other asexual multiplication; the root of the graft springs from sexual reproduction, for it is a seedling, and if the union is physically perfect—as I have shown is frequently the case—there is reason to suppose that grafting between consanguineous plants is better than propagating by cuttings or layers. In other words, grafting is really sexual multiplication, and if seeds have any advantage over buds in forming the foundation of a plant, graftage is a more perfect method than any other artificial practice. It is, in fact, the nearest approach to direct sexual reproduction, and when seeds cannot be relied upon wholly, as they cannot for the reproduction of many garden varieties, it is the ideal practice, always provided, of course, that it is properly done between congenial subjects. It is not to be expected that the practice is adapted to all plants, any more than is the making of cuttings of leaves or of stems, but this fact cannot be held to invalidate the system.

It has been said in evidence that grafting is a devitalizing, or at least a disturbing, process, that grafted plants lose the power of independent propagation. Mr. Burbidge writes that "any plant once grafted becomes exceedingly difficult of increase except by grafting." I have never known a case in which this is true. We are now forcing wood from both budded and cutting-grown Roses, and cuttings grow equally well from both. All our fruits grow just as readily from seeds from grafted as from seedling trees, and I have never heard of a well-authenticated case of a plant which grows readily from cuttings becoming any more difficult to root after having been grafted.

But is there direct evidence to show that "grafting is always a makeshift"; that it is a "toy game"; that "grafted plants of all kinds are open to all sorts of accidents and disaster"; that "own-rooted things are in all ways infinitely better, healthier and longer-lived"? These statements allow of no exceptions;

they are universal and iron-bound. If the question were to be fully met, we should need to discuss the whole art of grafting in all its details, but if we can find one well-authenticated case in which a grafted plant is as strong, as hardy, as vigorous, as productive and as long-lived as seedlings or as cutting-plants, we shall have established the fact that the operation is not necessarily pernicious, and shall have created the presumption that other cases must exist.

Some forty years ago my father took Apple-seeds from his old home in Vermont and planted them in Michigan. Upon my earliest recollection the resulting orchard was composed of some hundred or more lusty trees, but as most of the fruit was poor or indifferent, it was decided to top-graft the trees. This grafting was done in the most desultory manner, some trees being grafted piecemeal, with some of the original branches allowed to remain permanently, while others were entirely changed over at once; and a few of them had been grafted on the trunk about three or four feet high when they were as large as a broomstick, the whole top having been cut off when the operation was performed. A few trees which chanced to bear tolerable fruit, scattered here and there through the orchard, were not grafted. The orchard offers, therefore, an excellent test in this matter. Many of the trees in this old orchard have died from undeterminable causes, and it was an interesting fact that fully half, and I think even more, of the deaths have been seedling trees which were for many years just as vigorous in every way as the grafted trees; and of the trees that remain the grafted specimens are in every way as vigorous, hardy and productive as the others. And some of these trees have two tops, one of which was grafted shoulder-high in the early days, and the other grafted into the resulting top many years later. And those trees which contained both original branches and grafted ones in the same top show similar results; the foreign branches are in every way as vigorous, virile and productive as the others, and they are proving to be just as long-lived. Here, then, is a positive experiment compassed by the life-time of one man, for my father is still living, which shows that own-rooted trees are not always "infinitely better, healthier and longer-lived" than grafted plants. And, furthermore, cases like this are by no means rare, nor are they confined to fruit-trees. In the case of Peaches I have had a similar experience. The first orchard upon my father's place was composed entirely of seedlings, yet the trees were no longer-lived than budded trees, and they were attacked just as seriously by the yellows. And in this connection I will cite the fact that the old seedling orchards which still remain to us about the country are much more uneven, contain more dead trees or vacant places, than the commercial orchards of even the same age. This is due, as I have pointed out upon another occasion (On the Longevity of Apple-trees, before Kansas Horticultural Society, 1890), to the struggle for existence in the old orchards by which the weak trees have disappeared, while the grafted orchards, being made up of selected varieties of known virility and hardiness, have remained more nearly intact. And if the seedling orchards have suffered more than the grafted ones, it must be because they have had more weak spots.

I contend, also, that the universal favor in which grafting is held in America is a strong presumption in its favor. We differ among ourselves as to the best methods of performing the operation, but I have never heard an intelligent American condemn the system as necessarily bad or wrong. In 1890 there were growing in the United States nurseries 240,570-666 Apple-trees, 88,494,367 Plum-trees, 77,223,402 Pear-trees, and 49,887,894 Peach-trees, with enough other species to make the total of fruit-trees 518,016,612. All of these will go as grafted or budded trees to the consumer, and he will accept none other. It is true that half of them may die before they reach bearing age from various causes, but grafting itself plays a small part in the failure, as may be seen in the case of Grapes and small fruits, which outnumber the tree-fruits in nursery stock, and of which less than one-half probably reach maturity, and yet these are all cutting-grown plants. It is in nineteen cases out of twenty the carelessness of the grower which brings failure.

I have drawn my arguments and illustrations from fruit-trees, because I have had a more extended familiarity with them, and it has been my desire to determine if grafting is of itself necessarily pernicious, rather than to discover its merits in specific cases. I am sure that others can corroborate my conclusions on various ornamental plants, and I could myself cite many instances.

It is impossible, if one considers the facts broadly and candidly, to arrive at any other conclusion than this: Grafting is not suited to all plants, but in those to which it is adapted—and they are many—it is not a devitalizing process.

Notes on the Mid-winter Vegetation of Central Florida.

A BRIEF visit to central Florida, extending over the last fortnight of December and the early days of January, afforded an opportunity for making some general studies of the vegetation there. At first sight, perhaps, the most striking characteristic of the flora as a whole is the sharp line of demarcation between the species occupying different, but adjacent stations, corresponding mainly to difference in soil. The two main divisions of this kind are termed Pine-land or barrens, and hammock. On the Pine-land two species only are predominant—the Long-leaved Pine and the Saw Palmetto. The former are usually of small size, perhaps fifty feet in height, with trunks a foot in diameter, rather sparsely scattered as to numbers, the trunks usually unfurnished with branches except at the upper part, while the undergrowth is almost everywhere the Saw Palmetto, often abundant enough to nearly cover the soil, which seems to consist of nothing but white sand. Whatever may be the appearance of these Pine-lands at other seasons, they are at midwinter sufficiently barren and dreary.

In marked contrast to this is the hammock. Here we find a vegetation suggestive of tropical luxuriance. There are many kinds of trees, some of them attaining a large size, with a dense and tangled undergrowth made up of a wide range of species. Often the vegetation of the hammock rises up like a wall on the border of the Pine-land, with little or no intermingling of the characteristic species of the two floras. In the main the hammock appears to follow or is in the neighborhood of the water-courses, or in the vicinity of lakes, and the soil, though still apparently made up almost entirely of white sand, is far richer in plant-food than that of the barrens; but not infrequently in the midst of the rich hammock appear small patches of Pine-land, called locally Pine-pockets, sharply set off from the surrounding hammock, and possessing all the characteristics of the wide expanses of Pine-barrens, which occupy too much of the surface of the region. However, there are Pine-lands of better quality, where the trees grow to a larger size, and the Palmetto becomes a less distinctive feature of the undergrowth.

Still another division of the general flora is seen in the wet swamps found on the borders of lakes or along the streams. Here the appearance of the vegetation and the representative species are as markedly different from the two previous divisions as these are from each other. The characteristic tree is the Bald Cypress, in form not at all like the typical conifer, the gray trunks quite unfurnished, and the deciduous portions of the broad flat top now turned to a rich soft brown. In inundated swamps there is always an abundant development of those most remarkable root-growths, the knees, sometimes perhaps a hundred pertaining to a single tree, rising in height from one to five feet or more, and usually in the form of sharp narrow cones, and often separated from each other and from the parent tree by intervening spaces of water.

The prevailing color of vegetation everywhere at this season is a dull soft gray; this would hardly be expected in a country where so many evergreens abound like the Magnolias and Live Oaks, to say nothing of the Palms. But vegetation is for the most part now at rest, for here in this sunny clime they have as distinctive a winter, although the thermometer may not indicate it, as in more northern regions. The foliage of the Live Oak and other broad-leaved evergreens is now mature, and has lost the brighter green of the growing season; while the soft gray long moss, draping almost everything in wonderful abundance, of itself gives tone and color to the landscape.

While the northern visitor meets with numerous species of marked interest, perhaps the Palms at the outset take the highest rank. Of the eight unquestioned species found in the state, only four occur in central Florida, and of these only two are common, the Saw Palmetto and Cabbage Palmetto. Small plants of these two species, when seen at a distance, appear to the unpracticed eye much alike; but the always strongly curved midveins of the leaf-blade of the latter are never seen in the former. The Cabbage Palmetto, as seen here in mature and more perfect specimens, is really a stately and beautiful tree, a worthy representative of the noble family to which it belongs. Its favorite place of growth is the banks of streams or lakes if not too wet, sometimes forming groves exclusive of other trees; but it also occurs in the hammock scattered here and there in greater or less abundance.

In making excursions through the hammock one does not overlook the fact that many northern species here find a home. Sabal Palmetto and *Liriodendron tulipifera* appear as friendly

neighbors, the latter often reaching fine proportions, with trunks three feet in diameter. *Magnolia grandiflora* and *Acer rubrum* are within hailing distance, the ripened foliage of the latter still clinging to the branches, but the faded color suggesting an ill attempt at reproducing the scarlet hues which helped to make the woodlands of the north brilliant three months ago. On tree-trunks, quite strangers to its northern kindred, the Virginia Creeper finds support. The plants look dwarfed, as though not quite at home, but the still unfallen leaves, unlike those of the Maple, have taken on a brilliant color. Altogether, a considerable number of northern plants are seen, but southern species, as Magnolias and Palms, predominate, and give to the woodlands, as a whole, a distinctive sub-tropical aspect.

At Christmas-time one finds in an hour's ramble along the highways and on the borders of woods perhaps a dozen species in bloom. In this enumeration the straggling and belated flowers of several Asters and Golden-rods, now long past their prime, are not included. With especial interest one comes upon the Common Blue Violet, now fully in bloom, and growing in considerable abundance in damp places; but the plants are less vigorous and the flowers smaller and paler than at the north. On the sandy margins of Lake Charm we find the odd little *Utricularia subulata*, the single bright yellow flower in size quite out of proportion to the slender leafless stem. On comparatively dry soil are pretty clumps of *Pinguicula pumila*, the light purple or almost white flowers at first sight appearing more like Primulas than Butterworts. *Gelsemium sempervirens*, abundant everywhere on the margin of moist woods, is just coming into bloom, while near a group of Palmettos some broad white cymes of the Common Elder are fully expanded. Close down on the sand, in little patches, are the tiny creeping stems of *Oldenlandia rotundifolia*, the bright white flowers of relative large size. It is very pretty, but has little resemblance to its near relative, the Bluets of the north. These species, and perhaps a few others now in bloom, are here the real harbingers of spring.

But there are still to be seen interesting remnants of the autumnal flora. In this category ought, probably, to be placed the beautiful *Coreopsis aurea*; but whether of late autumn or early spring, it just now enlivens everywhere the sides of ditches and the borders of swamps with its warm golden color. Now almost out of bloom and coming into fruit is the shrubby composite, *Baccharis glomeruliflora*; it is six or eight feet in height, with numerous heads of inconspicuous flowers, but the upper branches are more showy with the dense tufts of white pappus, in beautiful contrast with the coriaceous evergreen leaves. This, however, is true only of the female plants, the species being strictly dioecious, and the pappus of the male plants but little developed.

Altogether, with expectations formed by long familiarity with glowing accounts of Florida as a region of perpetual bloom, one may find the vegetation at midwinter a little disappointing as to the abundance of flowers, but he cannot regard it, on the whole, as otherwise than sufficiently entertaining and instructive.

Ithaca, N. Y.

A. N. Prentiss.

New or Little-known Plants.

Smilax Pseudo-China.

THE great genus *Smilax*, represented in the tropics, and in the north temperate regions of the two hemispheres by some two hundred species, extends north in eastern America to beyond the northern limits of the United States. The species are herbaceous, or are stout woody climbers, and the genus is principally valuable, economically, for China-root, a drug once much more esteemed than it is at present, derived from the root of *Smilax China*, a thorny climber of eastern India, China and Japan, and for sarsaparilla, the root of various species found in different countries of tropical America. Botanists have distinguished fourteen or fifteen species in the United States, but these are still very imperfectly known, and in the flora of the eastern states there is no group of plants of whose life-history there is more to be learned. But as the different species are scattered over a wide extent of country they will never, probably, be thoroughly understood until all the forms are gathered together and cultivated side by side—a difficult undertaking, as many of the species are peculiar to the extreme southern states, and are not hardy in that part of the country where experimental gardens are usually found. The difficulty of

studying the plants of this genus in a satisfactory manner is also increased by the fact that the staminate and pistillate flowers are often produced on different plants, although the entire separation of the sexes does not appear to be as common as has been usually supposed.

The coast region from southern New Jersey to Florida is the home of the greatest number of species in the United States, although several extend into southern New England, and two of them far north. Of the value of the North American species of *Smilax* as garden-plants as little is

a less vigorous plant than the Greenbrier, with pale ovate leaves, glaucous on the lower surface and slenderer, and less terribly armed branches, and *Smilax Pseudo-China*.

This last (see Fig. 10), which is an old inhabitant of the Arboretum, where it has become thoroughly established, is a vigorous plant, rather common in dry or sandy soil in all the region from New Jersey to Missouri and Florida. It produces from tuberous root-stocks stout branches, which climb five or six feet high, and which are sometimes unarmed, and sometimes furnished with occasional weak



Fig. 10.—*Smilax Pseudo-China*.—See page 52.

known as of their life-history. Some of the species grow rampantly and produce handsome foliage and brilliant black or bright red fruit, and there are many places in the garden where they can be used with good effect. Three species only are well established in the Arboretum; these are the familiar Greenbrier or Bullbrier (*Smilax rotundifolia*), in all the northern states an inhabitant of moist thickets, which it often makes impenetrable by its climbing well-armed branches clothed with lustrous, broad, heart-shaped leaves—this is one of the most beautiful plants of its class, and one of the best to use to protect a boundary plantation from intrusion; the glaucous *Smilax* (*S. glauca*),

prickles. The leaves are deciduous, ovate, heart-shaped, sharp-pointed, three or four inches long, two or three inches broad, prominently five-ribbed, dark green on the upper and paler on the lower surface; they are borne on slender petioles from a half to two-thirds of an inch long, or two or three times shorter than the flattened stems of the flower-heads. The flowers, like those of the other members of the genus, are greenish yellow, and individually quite inconspicuous; they are described as diœcious, but a plant in the Arboretum, where for a long time there was only one individual, has produced crops of fruit every year, and the seeds of this fruit have produced plants. The fruit

is black, a third of an inch in diameter, and rather showy, although it is the beauty of the foliage, and not that of the flowers or fruit, which makes *Smilax Pseudo-China* a good garden-plant.

C. S. S.

Foreign Correspondence.

London Letter.

THE INTRODUCTION OF EXOTIC PLANTS INTO EUROPEAN GARDENS.—A paper on this subject was read in September, last year, by Dr. Gregor Kraus before the Naturalists' Society of Halle. The author has been to considerable pains in collecting information, and his paper has proved of sufficient interest to be reprinted. He divides the subject into six periods, as follows: The first period was the middle of the sixteenth century, when Hyacinths, Tulips, Lilies and similar bulbs were cultivated in Augsburg. It was not until nearly a hundred years after that they were taken up by the Dutch. The second period was marked by the introduction of North American trees, chiefly into France, the garden of Monsieur Robin, in Paris, then being famous for its collection of these plants. The third period began in the middle of the seventeenth century, when the Dutch introduced many plants from south Africa, and cultivated them in the Botanical Gardens at Leyden and Amsterdam.

A catalogue of the Cape plants in the former garden was published in 1668. Leyden is said to have possessed the first recorded glass house for plants; this was in 1599. During the latter part of the seventeenth century the formal style of gardening known as the French style was discarded by many in favor of the English style, the latter admitting of the use of a greater variety of plants than was possible in a typical French garden. The fourth period opens at the beginning of the eighteenth century and continued till near its close. During this time large numbers of hardy trees and shrubs were introduced from temperate regions. Then follows the Australian or fifth period, when the interesting vegetation of the Australian continent attracted the attention of horticulturists. The bulk of the plants were introduced by Kew and the English nurserymen. Dr. Kraus found the part played by the English in the introduction of exotic plants far too great and important to be included with that of the rest of Europe. He therefore decided to deal with it separately in a second paper. The Australian and Cape plants introduced into England did not receive much attention from the Continental horticulturists until the beginning of the present century. The sixth period is that of the last ninety years, and is remarkable for the enormous number of tropical plants introduced. It was not until Mr. Ward invented his little portable greenhouses, Wardian cases, that much success was attained. The chief cause of success, however, has been the shortening of the journey by the improvements made in ships, the modern "ocean greyhounds" bringing the plants often in less than one-fourth of the time it took half a century ago. Previous to this period the introduction of living plants was left almost entirely to botanical gardens and a few wealthy amateurs. But nurserymen now saw their opportunity, and dispatched collectors in the interests of trade.

Of the modern mania for Orchids, as he terms it, Dr. Kraus says very little. Orchid madness, he states, is almost peculiar to the English, who import plants by the ship-load and dispose of them by large auction sales. The plants thus eventually find their way all over Europe. Special houses even are devoted to single genera (he might have said species!) and some of the varieties are sold for enormous sums.

The taste for all kinds of exotic plants and their cultivation have, he says, not only proved a source of wealth, by adding an important industry, but it has also been of great value scientifically, many departments of botany and even chemistry having made considerable progress by means of the living material being available for study and research.

The history of exotic gardening in England, at any rate, differs in some important particulars from that given above. We therefore look forward with interest to the publication of Dr. Kraus' second paper.

Included in the first paper are various statistics showing the number of exotic plants cultivated in different periods, and, for comparison, of the number cultivated in the three largest representative collections in Europe now, namely, those at Kew, Berlin and St. Petersburg. The figures from Kew, which I know are approximately accurate, are herewith given, since they will, no doubt, prove interesting to your readers:

The number of species and varieties of the various classes of cultivated plants at Kew in 1891 are as follows: Orchids, 1,500; Ferns and Lycopods, 1,500; hardy Ferns and Lycopods, 800; Palms, 500; Cycads, 94; Pandanads, 36; Cyclanths, 19; Aroids, 313; Scitaminæ, 228; Bamboos, 71; succulents, 1,350; miscellaneous stove-plants, 2,756; miscellaneous greenhouse-plants, 3,021; bulbs and Oxalis (indoor), 700; herbaceous plants, Dicots, 2,000; herbaceous Monocots, 1,000; alpine, 1,000; hardy trees and shrubs, 3,000. Total, 19,800.

Roughly, therefore, we may say that Kew has in cultivation 20,000 plants, all, except a very small fraction, exotics. The figures here given do not include such plants as garden varieties of Pelargoniums, Narcissus, Caladium, Roses, etc.

The history of Kew and its collection will shortly be the subject of a special number of the *Kew Bulletin*. Last year was the jubilee of the nationalization of the gardens, although a portion of them existed as a private garden fully 200 years ago. This, with the house adjoining, was acquired by the son of George II. in 1730, and soon became famous for its botanical collection, William Aiton, a pupil of Philip Miller, being placed in charge of it. In 1841 it was handed over to the public by the present Queen, and Sir William Hooker was appointed Director. The collection now comprises almost every species of plant known to be in cultivation.

HORTICULTURAL TRAINING.—This subject is now being discussed with some warmth in the London gardening papers. The county councils for the home counties have decided to devote a certain sum annually to the work of teaching the art of gardening by means of lectures. Lecturers have been appointed for each county, and the work of teaching, by means of talk and magic-lantern illustrations, has begun. Some competent judges have questioned the wisdom of this kind of thing, no less an authority than the Director of Kew, Mr. Thiselton-Dyer, having stated publicly that "the cultivation of plants is an art which can only be acquired by practice, and therefore, it appears to me, cannot be taught in the lecture-room any more than painting or shoemaking. I know of no royal or theoretical road to the acquisition of a competent or even useful knowledge of the gardener's art except by beginning at the bottom and going through every operation, from the most elementary to the most difficult and refined. . . . The mere reading of books and attendance on lectures will never, in my judgment, make any one even a moderately competent gardener." This looks like a common-sense way of putting it. At any rate, one would not expect practical gardeners to do other than endorse every word here quoted. On the other side it is held by some that the teaching is not for professional men, but for farm-laborers, allotment-holders and women. Others ask if the English gardener of the present time is as good as his father, and go so far as to say he is no better, though he ought to be. They say he may be a better gardener, but he reveals a lamentable want of schooling when compared with the foreigner. I hear, too, that gentlemen complain of the want of polish in their gardeners, which makes them less pleasant companions in the garden than is desirable. Altogether, these critics seem to think that professional horticulture in England is in a very bad way. I had thought hitherto that England was the best horticultural school in the world, and that men trained here were in con-

stant demand wherever good gardening was wanted, whether in America, Australia, New Zealand, India, and even some Continental countries. I had entertained a suspicion that the several million pounds' worth of fruit annually imported into England was very largely sent here by enterprising Britishers who had settled in other countries where good fruit could be grown at less cost than in England. It appears from what is now written and preached that all this is ridiculously wrong, and that we need to supersede the old-time gardeners with a new and superior stock developed by means of lectures and magic-lanterns.

London.

W. Watson.

[Of course, the way to learn an art is to practice it rather than to read about it. But if in addition to this practice the

In addition to the numerous species and natural varieties, a number of hybrids have been raised in European gardens, such as the attractive and extensively cultivated *E. hyemalis*. These hybrids are generally easier grown, more robust in habit than the species, and equally floriferous.

In Europe, and especially in England, enormous quantities are grown every year for the market for house and parlor decoration. The general size of the plants brought to the London market varies from eight to eighteen inches in height. All are perfect in shape, healthy, and covered with flowers. The kinds generally grown for this purpose and kept on the market from autumn until spring are *E. caffra*, *E. hyemalis*, *E. gracilis*, *E. colorans*, *E. hybrida*, *E. ventricosa*, *E. Cavendishiana* and *E. persoluta alba*, but many other varieties are grown for commercial purposes.

While the moist, equable climate of England is favorable for



Fig. 11.—A Branch of the Black Oak (*Quercus tinctoria*).—See page 50.

pupil is judiciously instructed in some of the principles of the sciences related to the art, he ought to be a more intelligent practitioner and a broader man.—Ed.]

Cultural Department.

Ericas.

THE ornamental *Ericas* of the Cape of Good Hope number between four hundred and five hundred species. They are neat plants, with closely set foliage and an abundance generally of small cup or urn-shaped flowers, but sometimes with larger, tubular ventricose corollas with well-developed segments. Some are very fragrant, as the favorite white-flowering *E. caffra*.

the growth of *Ericas*, there is no reason why they should not be grown to equal perfection in this country. The bright summers will tend to ripen the shoots well and produce flowers in profusion. They do not like artificial heat, but will do well in a winter temperature of from thirty-five to fifty degrees. This can be had during a considerable part of the winter without resorting to fire-heat. If kept in a cool and somewhat shady position during the hottest part of the summer, they are not likely to be injured by the extremities of the climate. Systematic cultivation is, however, essential; and it would hardly pay to go through all the details with a small number of plants in order to grow them for the market to perfection. Cultivation for commercial purposes is likely to be profitable only when carried on on a large scale.

Without giving a list of the most desirable kinds, it may be said that, in addition to those already named, there are many

others which are interesting from every point of view. They may be had in almost any color from pure white to yellow, or through various shades of pink and red to purple. They differ widely in habit of growth, in shape and disposition of flowers and leaves. Some of them bloom in October, and a succession of flowers can be had until May.

The propagation of *Ericas* from seed requires much care and patience. The seeds are very minute, and the young plants tender and liable to damp off in a dull season. Still, as new and valuable varieties may be raised by this means, it is sometimes resorted to. The seed should be sown as soon as ripe in well-drained pots of finely sifted peat and silver sand. Pack the soil well in the pots by shaking them, and if the soil is very dry it should be thoroughly soaked before sowing. Sow the seeds evenly, and a gentle sprinkling will cover them sufficiently. The seed-pans must be kept in an even temperature of about sixty degrees in a light greenhouse. The air should be pure and dry, while the pots should be kept moist, without too much sprinkling, which will cause the seeds to decay, especially if they are old. Each pot should be covered by a pane of glass, and this must always be kept free from moisture, especially at the time of germination. Moist or overheated air at this period is almost certain to cause serious loss. When the plants are large enough to be handled they should be pricked off in other pots or deep pans of well-packed soil. After this they must be kept close until a strong healthy growth has begun. Water containing alkaline or mineral substances in solution should be strictly avoided. Rain-water is at all times the best for *Ericas*.

When the flowering season is over and growth commences a number of young shoots will be formed at the base of almost all larger plants. These shoots invariably give the best cuttings. As soon as they are half-ripe these shoots, with their lower leaves removed, should be cut, inserted obliquely in shallow pans filled with the same kind of soil as for seeds, except it may contain more sand. It is of importance not to insert the cuttings too deeply; in fact, the base should be covered only sufficiently to keep them firmly in place. All pans should be covered with bell-glasses, which must be kept dry by wiping away, as often as possible, all water condensed on the inside of the glass. If a propagating-house entirely devoted to *Ericas*, *Azaleas* and the like is used, no bell-glasses are required. The stage of such a house should come close to the glass, and a couple of hot-water pipes will be wanted to supply a gentle bottom-heat. When in use for this purpose all ventilating ought to be given below the stage when this is necessary. Facilities for shading on very bright days should be provided. The pans containing the cuttings should be plunged to the rim in coarse sand. Only one variety should be inserted in each pan, so that the growth of all may begin at once. When the cuttings are well-rooted abundant ventilation is needed.

In the following spring the young plants are to be potted singly in two-inch pots, and if kept in close frames for some time they will soon root well. As the plants go on growing attention must be paid to repotting before they become pot-bound, and the young shoots should be trimmed to make the growth dense and uniform.

Young plants should be repotted every spring and removed to the open air early in summer. Beds should be prepared in the open grounds for this purpose by covering them a couple of inches deep with cinders or ashes and leveling the surface. The beds are made four feet wide, and the plants placed at a sufficient distance to allow light and air on all sides. Young plants must be trimmed several times during the season. They can be cut in such form as the natural tendency of each species suggests. This cropping should not extend below the soft wood. Plants for flowering must not be trimmed in this manner, as they must have sufficient time to ripen their shoots.

Ericas must never be allowed to dry up, but overwatering is very injurious. When potting, the roots must not be injured or disturbed except at the bottom, when the young roots should be gently disentangled and the soil should be packed in very firmly. Common peat, with very little sand, is best for the more robust, soft-wooded kinds, which can also be potted less firmly than the smaller hard-wooded species, which in their native land grow in crevices of rocks, on hard stony ground, chiefly in soil produced by their own decaying leaves. For old and large specimens it is advisable to put some bone or horn-shavings in the bottom of the pot or tub, or use well-decayed cow-manure.

During dull moist seasons *Ericas* are apt to suffer from mildew. The only way to counteract this evil is to sprinkle them with sulphur. If planted too deep the water is liable to cause

the bark of the lower part of the stem to loosen and decay. It is better to plant a little too shallow than too deep.

New York.

N. J. Rose.

The Value of Wind-breaks.

WHEREVER winds have a destructive sweep there is a lack of those provisions that nature would supply if let alone. Run an old-fashioned fence across a lot, and in ten years it would be the centre of a row of young trees, forming a solid wind-break. On knolls hereabout, if barred from cattle, Hemlocks and Pines start. Fifty years ago I dragged rails to enclose a bit of land, which, to my boyish eye, was a delightful spot, where some tiny evergreens were trying to get a start on ridges and slopes and knolls. I was not interfered with, and so the cows were shut out. The result is now a thing of beauty. But that is not all; the winds that used to leap off the hill-top down on our orchards and barns are now decidedly broken. The only conifer native to our hills is the Hemlock, and its beauty is hardly equaled. But the *Arbor-vitæ* readily takes to our soil, and I have used that for my hedges. Under the lee of these the sharp winds never are felt, and the effect is largely to restore climatic conditions that existed before the forests were so extensively cut away. Quinces, for example, bear once more as they did fifty years ago.

On one side of a street here fruit abounds that cannot be grown across the way. I have no trouble with *Diana*, *Isabella* and *Iowa Grapes*, while even *Concords* do not get a fully ripe flavor a few hundred rods away. This is, to be sure, owing partly to the contour of the land, but it is also due largely to the additional protection given. The advantages are not only general, but special and local; we cannot only affect climate on a large scale by forests and by our plantations of screens and wind-breaks, but we can make our own lawn or orchard climate.

Where land is abundant a belt of evergreens may be set. I have in mind one large orchard in this town, about one-third of which is sheltered in this way, and is in perfect health; two-thirds are exposed to the sweep of north-west winds, and the trees are of no use except for fuel. The line of demarkation is plain to every one who drives by, and the contrast is almost startling. The effect on annual crops may not be so apparent, but it is logically sure. I am confident that one of the first duties of a purchaser of land is to study its exposure and plant screens against the most trying winds. While we are waiting for the Government to solve the forestry problem, we can in a small way control our own local climates to advantage.

Clinton, N. Y.

E. P. Powell.

Alternanthera Leaf-blight.

DISEASED specimens of *Alternantheras* have been recently received from four widely separated greenhouses in the eastern states, and a visit to several propagating-beds in New Brunswick shows that the trouble in question is prevalent here. In its worst form the leaves blight, coil up and fall away, leaving the short stems of the plants bare. When the disease is in a mild form only, here and there a leaf is seen with a brown spot upon one side or at the tip. These spots contain countless threads of a parasitic fungus, pushing into the healthy portions of the leaf and spreading the spot. Upon the older portions of the brown patch a considerable number of nearly spherical buds may be seen half-sunken within the substance of the leaf. At the upper free side in the centre is a small opening, through which, when mature, the small colorless spores exude in large numbers, and by means of which the blight fungus is able to spread through the propagating-bed. This disease is caused by a species of *Phyllosticta*, which, while probably not the same, is closely related to *Phyllosticta Amaranthi*, upon a species of Pigweed (*Amaranthus retroflexus*), a near neighbor of the *Alternantheras*, and a member of the same family. One reason why this blight is not particularly conspicuous is due to the variegated foliage of the host. Upon plants with uniformly green foliage a blight equally abundant would be quickly observed. It is, however, none the less destructive because not easily seen, and should it continue to prevail it is quite certain that some preventive measures will be needed. As this blight is similar in nature to the black rot of the Grape, it is doubtless true that the Bordeaux mixture would prove effective. Better than this, because not coating the plants with lime, would be the carbonate of copper compound, made as follows: Dissolve three ounces of carbonate of copper in one quart of ammonia, dilute with water to twenty-two gallons, and spray the affected plants at least once a week.

There are so many fungous enemies in the greenhouse that the spraying-pump will come to be a regular adjunct to the propagating-bed and to the growing of plants under glass.

Rutgers College.

Byron D. Halsted.

Galvanized Iron for Propagating-beds.

IN building a greenhouse five years ago I made a propagating-bench of the usual width and fifty feet in length. As a test, half of the bed was laid with a slate bottom and the other half with galvanized sheet-iron. The experience of these years does not show any essential difference in the rooting of cuttings in the bed. The bottom-heat does not seem to vary with the slate or the iron, when the average depth of three to four inches of sand is used as a covering. It is probable that less depth of sand and careful tests would show a higher temperature on the iron than on the slate; but in our ordinary use of the greenhouse there has been no appreciable difference.

It has been a surprise to me that the galvanized iron shows no sign of wear. The bed now looks as though it would last as long as the two by three-inch scantling upon which the sheets and the slate were laid. Having had the same satisfactory results in the use of sheet-iron in other places, I decided this season to use the sheets as a bottom for propagating-beds which we were building. As the houses were constructed mainly for one purpose, the result has been more than satisfactory. The beds can be maintained at any desired degree of temperature and moisture with the greatest ease. In some houses and under some management there might be danger of an excess of moisture in the sand for some cuttings; but in such cases it would be easy to provide drainage by punching holes in the sheets, as might be found necessary. Ordinarily, this would not occur.

In regard to cost, I find that the sheet-iron comes next to boards. For a heavy quality the cost is \$4.50 per 100 square feet. Considering the ease in laying, this must be regarded as a moderate expense; and considering the very satisfactory results, it seems to me that it is worthy of more general use.

Waban, Mass.

Wm. C. Strong.

Barberis Thunbergii.—Those who desire to increase their stock of this handsome shrub will find this a favorable time to sow seeds. Seeds from berries gathered from the bushes now will germinate better than those gathered earlier in the season, as the weathering effects of frost seem to help germination. The seeds should be rubbed clear of the pulpy matter which encloses them, as berries planted whole will sometimes lie in a dormant state for two years, or, at least, until the resinous matter surrounding them has decayed. Even with this precaution, it takes nearly a whole season for the crop to come up. Like almost all Barberries, this species is very easily reared, and seedlings may be planted directly from the seed-bed as soon as they are large enough to handle. This, probably, is the best of all the Barberries which are hardy in this latitude. *B. Darwinii* and *B. stenophylla*, two equally handsome species which are evergreen, at least in southern Europe, are doubtfully hardy here. With full exposure, *B. Thunbergii* makes a neat and perfectly regular bush. There is at the Bussy Institute a remarkable specimen, being one of the first raised in this country, which every autumn is covered with thousands of scarlet berries, and is so conspicuous an object that it attracts attention from a considerable distance. The berries hang on the bushes until spring, as no birds or animals seem to care for them.

Wellesley, Mass.

T. D. H.

Correspondence.

The Forests of Washington.

To the Editor of GARDEN AND FOREST:

Sir,—The forests of western Washington are inconceivable to those to whom the word forest suggests a vision of sun-lit green. Green they are, but it is the sombre darkness of the conifer. To the woods of the Blue Ridge they are as the movement of Milton's lines to the lilt of Dobson's song.

Imagine yourself seated in an old stage, with a pair of Cayuse ponies hitched to it, and driving for the first time, on a December afternoon, through a belt of Washington timberland. The timber skirting the stage-road will, of course, be very inferior, since the road has chosen the direction of least resistance; but in your innocence you will not guess this, and will promptly conclude there never was another spot just like this peculiar one where you find yourself. It is mid-December, but the air is like one of the misty days of late October; and the grass on the road-side has a vividness of green, a cer-

tain mossy depth of color, as though the earth were covered with layer upon layer of tiny-leaved grass that is like nothing but the spring grass of Great Britain. There are no flowers by the side of the road, but Ferns in the wildest luxuriance. They range in size from the minutest seaweed-like tracery of green to the Elk Fern, as tall as a man, and with the decorative vigor of a tropical Palm. Above all this, so far above as to seem of another world, reach the forest-trees. They are all evergreens. Round-bodied, straight and flawless, they stretch upward one, two, and even three hundred feet. They are so tall that one scarcely observes the slightest tapering in the majestic columns at the point where at last they throw out the first limb, laden with heavy foliage of down-drooping darkness. There are not twenty or a hundred of these trees in range as you creep along, but tens of hundreds; they grow as closely as Hop-vines in a Hop-yard. The wonder that ever increases is how the soil supports such a growth.

In many places the trees have fallen, and lie tangled together, forming a barrier twenty or thirty feet high. If they should all fall the pile they would make would be about as high as the trees now stand. The density of the forest makes it almost impenetrable; for, beneath the up-reaching Pines, the ground is covered with the tough tangle of Sallal (*Gaultheria Shallon*), hung with pink waxy bells, which enmesh the feet at every step; and the riot of the Ferns, that snap back into the face, further impede the way. Four miles is as far as a strong man can walk in a long day's struggle with the baffling, entrapping blockade of living green.

The gigantic conifers and the immense Ferns are the living representation of those pictures of the carboniferous age that decorate the pages of geologies. We seem to have prowled into Nature's laboratory, and caught her at coal-making some eons too soon. Many beds of coal have been discovered; but it is lignite coal, still soft and half-formed. The stone, too, is crumbly and unfinished. The whole energy of the black mellow soil goes into the monster evergreens, and there seems no place for flowery frivolities beneath their sombre magnificence. This is in the interior of the woods. Down near the salt-water of the Pacific the character of the growth changes. There the Tide-land Spruce (*Picea Sitchensis*) prevails, a scrub growth, averaging about one hundred feet in total height, and of a gnarled and irregular figure. Upon every notch or crotch of the limbs is a clump of moss, so vividly green that even the grass pales in comparison; and, from this bed of mold, spring hundreds of Ferns, but always of one sort, with a delicate but simply pinnate frond.

The curious excrescences of moss give the Tide-land Spruce an unnatural look that is slightly revolting; it takes the character from the trees' anatomy; but, in themselves, these bosses of green, pierced by the Fern-ironds, are lovely. The south sides of many of the trees are covered with this deep moss, and from it the Ferns cascade downward to the ground.

Among the Tide-land Spruce are patches of small Alders, gray for the season, and grayer with fine filmy Spanish moss, hanging in shreds, and giving a ghostly indefiniteness to their outlines. Under-foot the same vivid moss and Ferns, only the Alders, stretching their twigs like a seine in which filaments of seaweed have been caught, speak to us of winter in this climate of moist mildness, in this "land where all things always seem the same."

Bergen Point, N. J.

Louise Herrick Wall.

The Hardiness of certain Evergreens.

To the Editor of GARDEN AND FOREST:

Sir,—Your correspondent, Mrs. Dandridge, suggests reports on the hardiness of certain evergreens. In this neighborhood English Laurels do not survive, even when given slight protection. I have never seen one left outside for the winter that was alive in spring. *Aucuba Japonica* does well where it gets a little shelter; near a dwelling or under the shelter of deciduous shrubs it will survive without any covering. *Hydrangea hortensis* and *H. Otaksa* are never killed outright by the winters here, but trying seasons sometimes kill the ends of the branches, and then we get no flowers, for the flowers are produced on the wood of the previous season. So, to be sure of bloom, it is better to pack leaves among the tops. I had no idea that *Chimonanthus fragrans* was considered tender. We never protect it hereabouts, and it is never injured. *Deodar Cedars* do very well when protected for a few years while small. There are very fine specimens here, one in particular, which stands on a rocky eminence. There are several flourishing trees of the great evergreen *Magnolia* about us, and many more could be had if they were intelligently looked after for a few years after being planted. A

great step toward success is to get plants from seeds perfected near home. Seeds from Washington or Richmond trees would give a hardier race of seedlings than would those from farther south. I would advise Mrs. Dandridge to cover the top of her plant with forest-leaves instead of having it protrude from the barrel. In late winter it is the extreme tops that suffer. Over a small Magnolia I have placed this winter a box with a removable cover. When it is not freezing weather the top is taken off. There are no leaves packed about the plant, and I feel confident that the shelter the box affords will suffice for its protection. *Yucca angustifolia* is quite hardy, but *Y. gloriosa* is not. The latter lives, but loses its tops nearly every winter, so that it makes no trunk. The pretty shrub, *Leycesteria formosa*, so well known in English gardens, survives our winters. And we are trying again this winter, although we lost our plants on a previous trial, *Choisia ternata*, *Ilex cornuta*, *Nandina domestica* and *Elæagnus pungens variegata*.

Germantown, Pa.

Joseph Meehan.

Meetings of Societies.

The Western New York Horticultural Society.—I.

THE thirty-seventh annual meeting of this prosperous society last week at Rochester brought together 250 of its 300 members. The address of the President, Mr. W. C. Barry, was a comprehensive review of the horticulture of the past year. The abundant crops of fruit and the comparatively small returns was the strongest proof, he thought, that the grower should exercise the greatest care in packing and shipping his products. The loss from lack of careful sorting was never so apparent as in years of plenty. The importance of recent discoveries in the methods of combating injurious insects and the diseases of fruit-bearing plants was spoken of, and credit was given to the aid which experts in economic botany and entomology were giving to practical fruit-growers. The possibilities of the improvement in fruits and in ornamental plants were dwelt upon, and the society was urged to encourage every effort to produce fruits surpassing the varieties now in use, in size, in color, in appearance, and of increasing the beauty and attractiveness of flowers and ornamental plants. The society was congratulated on the work it had accomplished, on the harmony which had prevailed through its history, on the regularity and growing interest of its meetings and the steady increase of its membership.

As in former years, discussions relating to orchard-fruits, especially to apples, pears and plums, were the prominent features of the meeting. Not only did the greater number of the set papers relate to these subjects, but the discussions which followed them, and which were participated in by a large number of the audience, showed that the members were deeply interested and thoroughly schooled in the practice of the new methods. Papers referring to plant-diseases and their treatment were followed by searching questions, to which the experts present replied, and many practical growers related their experience in the application of insecticides and fungicides. As a rule, these applications were reported as beneficial, and this was particularly true of the applications made to nursery stock. There seemed to be a general opinion that ammoniacal carbonate of copper was preferable for later applications in the case of fungous diseases of the Grape after the Bordeaux mixture had been used early in the season. The objection to the use of the Bordeaux mixture late in the season was that the traces of the fungicide remained upon the fruit, and although analysis showed that the amount of copper upon the grapes was less than the amount present in many of the foods which are continuously eaten by man, nevertheless the appearance of metallic coating on the grape was forbidding, and it should be avoided if possible.

There are no more valuable reports published than those of the meetings of this society, and, therefore, it is a matter of general interest to know that a larger supply will be printed and distributed hereafter. The expense of the printing of these reports will hereafter be borne by the state, and they will be bound up with the reports of the

State Agricultural Society, and in this way have a wider circulation.

Mr. Wm. C. Barry was again elected President; Mr. S. D. Willard, First Vice-President, and John Hall, of Rochester, Secretary and Treasurer.

One of the most interesting of the papers read was by Professor I. P. Roberts, of Cornell University, and we reproduce it below almost entire. Our report of the meeting will be continued next week.

MAINTAINING THE FERTILITY OF THE SOIL IN ORCHARDS.

If the land produces well, we usually call it fertile; if it produces nothing, we say it is barren; and yet the land which produces little or nothing often contains far more of the elements of plant-growth than does the productive soil. The products of cultivated land are not, as a rule, the measure of the amount of plant-food which it contains, nor the amount which may be liberated by scientific culture. In our farm vernacular fertility means production, whereas it should mean the amount of plant-food which can be profitably set free by the best methods. To the orchardist the amount of plant-food which the trees can get out of the land is practically the true measure of the fertility of that land.

Now, the roots of an orchard, after it is fairly well grown, occupy very fully the entire ground except a small portion of the surface. From this time on, the feeding roots are practically confined to the exact ground from which they have been feeding for the last fifteen or twenty years. The roots of fruit-trees set the ordinary distance apart have extended themselves nearly as far into the subsoil at fifteen years of age as they will ever go, because there is little more food that can be reached in that direction. The surface roots have by this time extended themselves as far as they will grow, because they have met and interlocked with those of the adjoining rows.

How to get the orchard grown up to the time when it is in full bearing is now to be considered. First, the land should be reasonably dry. If it is very wet, it should be made dry by draining; if only slightly wet, the field may be thrown into ridges as wide as the rows of trees are to be apart, and if the plan is not to drain the land after the trees have begun to bring an income, then the rows and ridges should be wider—that is, a little land may be sacrificed in order to save the expense of draining, and where the land is not too dear, this is often the cheapest way to solve an embarrassing problem. Having decided the method of drainage, a full year should be given to preparing the land. It should be plowed deep and often, and if thrown in ridges or lands the subsoil-plow should be used freely in the bottom of the dead furrows. If the land is at all sandy and poor the plowings should be not less than four, and none of them should be later than the middle of September. With this start, for the next five to fifteen years, according to the variety of trees set, enough plant-food can easily be set free by shallow plowing, cultivating and the use of surface crops. Many a young orchard is ruined by overfeeding with manures, as are also many by starvation, while the soil contains an abundance of food for all necessary growth. The tree is too often treated like the unwise dairyman treats his stock, which are fed to repletion when young, and semi-starved at maturity, when the demand for food is great, especially if a large surplus product is to be secured. Healthy, continuous, hardy growth, and not too much stimulating nitrogen, is what is wanted in both cases.

In rare instances the land may be deficient in fertility. In that case, a little mineral fertilizer will be all that is needed. When the orchard begins to fruit heavily there will be an extra demand on the soil for food, and that must be met quickly and in a liberal way if large, superior fruit is secured. As the roots have been drawing upon this soil for several years, and as they can find no soil from which they have not already extracted the larger part of the readily soluble food, the tree suffers; the quality and quantity of the fruit diminish, and the tree becomes an easy prey to its enemies if something is not done. Something usually is done at about this period of the orchard's existence. Not infrequently it is seeded down to Timothy, and very often this grass is cut for hay, and thus more fertility is taken from the land. Of course, the Apple-orchard cannot well be kept under the plow all the time after it has come into full bearing, because of the inconvenience of gathering the fruit on a plowed surface in the wet fall months. There is usually a better way than this. Clover should be raised so far as possible in the orchard, and it is not necessary to plow it up often, as Clover catches on sparsely-seeded land, nearly as well without as with plowing. This treatment usually

provides sufficient nitrogen in conjunction with a little farm-manure.

It should be kept in mind that we are dealing with trees that have occupied the ground for several years; that have creamed the soil; that have already trespassed upon and robbed their surrounding neighbors, and that in turn have been robbed; and there is no escape from slow starvation if the trees are reasonably thick and nothing is done.

And first it should be remembered that, for the good of the trees and of the land, and for the total value of the product, the amount of fruit raised on a tree should not be large, and the quality should be of the best. Bearing this in mind, some questions arise. Is it not possible to prune the orchard by the same rules which are observed in trimming Grape-vines? Our grandfathers let their vines grow as they would, and they never produced any really fine bunches of grapes. As soon as we learned to control and direct the growth of the vine the value of the fruit increased a hundred-fold, while the least possible amount of fertility was removed from the land. Is it not quite possible that fertility might be conserved, and the quality of King apples, say, be improved by reducing the length of the limbs upon which they grow? Is it true that the nearer the total product of fruit is to the food-supply of the tree the better the results? or, to state it in another form, Are the apples improved when the material of which they are formed is transported eighty feet through root and branch before they receive it? Is the soil of the orchard unnecessarily drawn upon by growing too much timber?

We assume that the fertility of the orchard has been maintained up to the time of its bearing. What I have said also implies that the trees have not been unduly forced by manure, but have made a steady, healthy growth, and have come into bearing early. Just as a heifer is simply kept growing and great care is taken not to overfeed or change the direction of her inbred tendencies while she is young, and as she is more liberally fed as soon as she begins to produce something, and as she is fed moderately, liberally or very liberally, according as she responds to the food given, exactly so should the orchard be treated. The amount and kind of food furnished to it should be studied as carefully as is the ration of the dairy-cow. What kind of food does the orchard want? Like other plants, it is likely to have enough of all kinds except potash, phosphoric acid and nitrogen. How shall it be secured? Would it be best to get the annual dressing of fertility wanted by purchasing commercial fertilizers, or by the purchase of cattle-food, to secure the desired elements in the form of farm-manures by the help of animals?

If the orchard contains ten acres, it will carry one hundred sheep from May to October, provided one-fourth of their food be furnished to them in the form of bran and cotton-seed or oil-meal. One hundred sheep, weighing eighty pounds each, will require for one-fourth of their daily sustenance one-half pound of meal per head. In the spring they will want something less than this, in the fall something more. If these animals take ten per cent. of the manurial value from their food for their natural growth, there will still be left scattered on the land in solid and liquid droppings 228 pounds of nitrogen, 146 pounds of potash and 90 pounds of phosphoric acid; or 22.8, 14.6 and 9 pounds respectively per acre.

One hundred and fifty bushels of apples—that is enough to the acre if they are good enough, and too many if they are poor—contain about eight pounds of nitrogen and twenty-four pounds of ash, thirteen pounds of which is potash, and one pound of phosphoric acid, worth together \$1.86.

How much the trees will require for increased growth, how many of the leaves will be blown away, how much nitrogen will escape by leaching and how much will be restored to the soil by the clover-roots, and how much of the fertility produced by feeding the bran and meal the trees will be able to readily secure, neither the theorist nor the practical man can tell. No charge should be made the sheep for the grass, as the work they will perform in transforming the poor apples and the worms into valuable fertilizers will be a fair equivalent for it.

Summing up the case, we have the orchard raised through skill and the unaided fertility of the soil. The draft made on the land by the production of apples and the necessary growth of wood, and the losses of fertility which may occur, are to be fully met by restoring to each acre yearly, through feeding animals upon it, some twenty-three pounds of nitrogen for the eight pounds removed by the apples, fourteen and a half pounds of potash for the thirteen removed, and nine pounds of phosphoric acid to replace the one carried off. It will be seen readily that if there is any deficiency it is likely to be in the potash, as scarcely more is returned to the soil than is re-

moved by the fruit; so a dressing of potash is likely to not only improve the quality but the color and aroma of the fruit as well.

The hundred sheep would consume in five months at pasture 3,750 pounds of oil-meal, worth \$28.00 per ton, and a like amount of bran at \$17.00 a ton, and the two would cost together \$82.50. The value of the plant-food left on the soil, computed at commercial prices, would be \$43.07; but whether it is really worth that or not no one can tell. Can a hundred lean sheep, purchased in the spring, be made to gain \$100.00 in value in five months of grazing and grain-feeding with a half a pound of meal per day per sheep, or with the feeding of three-fourths of a pound, if thought advisable? I cannot answer these questions accurately myself, and I leave them for your consideration. Yet I believe that the orchardist is growing too much wood, too many apple-seeds, too many apples, too poor apples, too many badly colored and badly flavored apples, and that this may be remedied by heading back the trees in lieu of thinning them, and by furnishing to the bearing orchard yearly a reasonable amount of available plant-food, largely through the aid of plants and animals. I am well aware that the methods here suggested will have to be varied to suit local conditions; still I claim that the principles involved are correct, and that if they are intelligently practiced in connection with the best-known methods of defending the fruit from its enemies, a great advance will be made.

In the Peach and Plum orchards the practices which I have suggested are not likely to be the best, as it will be found advisable, in most cases, to keep these constantly under cultivation. But here, as in the former case, fertility may be preserved by feeding animals during the winter, and by preserving and removing the manures produced to the orchards. I have the utmost faith that this method of getting plant-food, through plants and animals, will be found to be the most economical in most cases.

I contend (1), that the soil should be cultivated and plant-food set free to the utmost limit; (2), that leguminous and tap-rooted plants should be used as plant-food gatherers; (3), that animals should be kept as much for the value of the manure they produce, as for the profit realized from their other products; (4), that the least possible amount of stalk and vine and limb be grown consistent with economy and the health of the plant; and (5), after having practiced all the economy possible, if there is still a lack of fertility, in order to secure the highest quality of product and the greatest net income, that commercial fertilizers of a high grade should be applied with a liberal hand. If it is found at any time that commercial fertilizers give better net results than farm-manures, then there should be no hesitancy in changing from one to the other. I believe that farm-manures which have lain in the open yards or have been heated, and which have to be drawn long distances, are far more expensive than are high-grade fertilizers. Well-preserved manure is worth, on an average, scarcely more than \$3.00 per ton, and our experiments prove that such manure, exposed in piles from April to October, often loses one-half of its value; therefore I am led to believe that many tons of manure which are transported from the city contain less than a dollar's worth of soluble plant-food. This manure may act beneficially as a mulch, but, so far as the plant-food it contains is concerned, it is too often an expensive way of preserving the fertility of the land.

Notes.

At the late meeting of the American Forestry Association the committee on Arbor Day reported that the day was now officially recognized and observed in thirty-seven states and territories.

We learn that by the fire which last week consumed the greenhouses of H. Meyers, of Passaic, New Jersey, more than 3,000 plants of *Clematis paniculata* were lost. This shows the growing popularity of this plant, which is of comparatively recent introduction. Fortunately, time enough still remains to get up a stock for the spring trade.

Messrs. Burpee & Co. publish a circular in which it is stated that the Bush Lima Beans which they distribute originated with Mr. Asher Palmer, of Chester County, Pennsylvania. The story goes that this particular plant, found in a field of ordinary Lima Beans, had been cut off about half an inch above the ground by a cut-worm, but that it had bent over and rerooted, and the result was the Bush Bean.

Professor L. R. Taft, horticulturist of the Michigan Agricultural College, publishes the following list of varieties of Beans

which have proved satisfactory at the experiment station there: Wax Beans—Cylinder Black Wax, Speckled Wax, Saddleback and Mammoth Wax; Green-podded varieties—Osborn Forcing, Dakota Soup, Hatt No. 3 and Shah; for field-culture—Burlingame, Snowflake and Hatt No. 2½.

According to Mr. Conder, who has written so much about the flowers of Japan, the Japanese cite 269 color varieties of the Chrysanthemum, of which 63 are yellow, 87 white, 32 purple, 30 red, 31 pale pink, 12 russet and 14 of mixed colors. A fancy prevails in the country that in this flower the same tint is never exactly reproduced, and that in this it resembles the endless variety of the human countenance.

In the recent report of the Superintendent of Public Instruction of the State of New York it is said that the interest in the planting of trees on Arbor Day and at other times has been greatly stimulated throughout the state during the past two years, by prizes offered for the best-kept district school-grounds by Mr. Wm. A. Wadsworth, of Geneseo. Last year the first prize of a hundred dollars was awarded to District School No. 6, of New Windsor, Orange County, and the second prize of fifty dollars to District School No. 1, of Manheim, Herkimer County.

Professor Bailey, of Brown University, writes in *The Bruonian* that the custom of planting class trees was begun there some thirty years ago, and that a great deal of eloquence and sentiment was expended over the young plants. Every tree is gone, however, the ground having been occupied for other purposes in most cases, although we infer that some of the trees perished from lack of care. He points the moral that if trees are to be planted in future they ought to be placed where there is a reasonable certainty of their remaining, and he might have well added they should never be planted unless they are planted well and there is a reasonable certainty that they will be well cared for afterward.

In a letter to the American Forestry Association, ex-Senator Edmunds writes: "The subject of forestry is of immense importance to the future welfare of all our countrymen, as well in Vermont as in the arid regions of our one country. I have seen in Europe much of the remediless evils of stripping the hills and mountain-sides of their forests great or small, and I have seen in our temperate and well-watered climate of Vermont how great has been the loss from reckless timber-cutting. The devastations of a dozen years can hardly be repaired in half a century, and so every energy of reason and persuasion ought to be brought to bear upon the public intelligence to avert the evils that so seriously threaten large parts of the republic from the destruction of the forests."

Professor Georgeson, of the Kansas Agricultural College, raised last year a crop of the Japanese Soy Bean (*Glycine hispida*), and offers to distribute them to such farmers of his state as are willing to try them. They are unknown, we believe, to the agriculture of this country, although sixty varieties of them, varying much in size, color, earliness, etc., are in use in Japan, and they have yielded in Kansas from twelve bushels to nineteen bushels an acre on low ground which was too wet for proper cultivation. Professor Georgeson thinks these beans, on account of their nutritious qualities, will prove valuable for farm crops and useful for stock feed, while, at the same time, they are excellent for table use. Professor Georgeson also offers for distribution two varieties of a small red bean which belongs to the species *Phaseolus radiatus*, also unknown in this country. They are more especially for table use, and are reputed to be the finest-flavored beans in existence.

A correspondent of *Meehan's Monthly*, in writing of *Dentaria diphylla*, in many places called Crinkle Root, on account of the peculiar shape of its roots, and Pepper Root in other places, on account of the pungent taste of its roots, states that the roots dried and pulverized have long been used as a condiment by the Canadian Indians just as it was used, according to Michaux, by the Indians of the Carolina mountains. To many persons these roots are quite palatable, and Mr. Meehan endorses the opinion of his correspondent that it is surprising that this root has never been introduced into vegetable-gardens. Many garden-plants, like the Radish, Turnip, Horseradish, etc., belong to the same family, and, in their improved state, have become necessities of life, and yet, when quite wild, they seemed no more promising as food-plants than the Crinkle Root. By judicious cultivation and selection it is probable that this root might be improved so as to be a valuable addition to our food-supplies.

A circular from the Horticultural Department of the Columbian Exposition states that a Rose-garden has been designed

on the grounds to contain not less than 50,000 plants, besides special areas for other groups. As substantial premiums are to be offered for Roses in addition to the awards that are to be offered by the National Committee, Rose-growers are invited to prepare plants for this garden. Hardy Roses on their own roots must be in three and a half-inch or larger pots of the current year's growth, or they may be dormant plants one or two years old. Of course, Tea Roses, Noisettes and other tender kinds will require different treatment, and it is suggested that strong plants in five-inch pots be carried over in cold frames for planting early in the spring of 1893. It is also proposed to have large displays of herbaceous plants during their best season of flowering from the 1st of November, 1892, to the 1st of April, 1893, including Chrysanthemums, Cyclamens, winter-flowering Primroses, Cinerarias, Calceolarias, Amaryllis, Dutch bulbs and the like. Instructions have been sent to the various firms who propose to contribute flower-seeds, that plants are to be grown from them in the most approved manner without expense to the contributor, and it is expected that awards will be made for the plants produced in the order of their merit.

"The treasures of the common are endless," writes Mrs. Martin in her *Home Life on an Ostrich Farm*, of the neighborhood of Walmer, in Cape Colony, "and first and loveliest among them all is the little Wax-creper (*Microloma lineare*), than which, tiny as it is, I do not think a more perfect flower can be imagined. It is as modest as a little Violet, and you have to seek it out in its hiding-places under the thick foliage of the bushes, round the stems of which it twines so tightly that it is a work of some time to disentangle it. You also get many scratches during the process, for it loves to choose as its protectors the most prickly plants; but when at last you hold the delicate wreath in your hands, and look into its minute beauties—the graceful curves of the slender stalk and tendrils, no two of which ever grow alike; the long narrow dark green leaves, and the clusters of brilliant carmine-tinted flowers, each like a tiny exquisitely shaped vase cut out in glistening wax—you are amply rewarded. It is, indeed, one of the masterpieces of nature. This little flower does not bear transplanting well. We often tried to domesticate it in our garden, but the plants invariably died. It was quite the rarest of all our flowers. We have never seen it anywhere but about Walmer, and there it grows only in small patches, five or six plants close together, and then perhaps no more of them to be seen during the whole of a long walk."

Catalogues Received.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLES:—Parks for Growing Cities.....	61
Protection of Public Forests.....	62
The Boston Metropolitan Park Movement..... <i>Sylvester Baxter.</i>	62
Colonial Summer-houses. (With figures.)..... <i>John De Wolf.</i>	63
Notes of a Summer Journey in Europe.—VI..... <i>J. G. Jack.</i>	63
Notes on Cone-bearers of North-west America.—I..... <i>J. G. Lemmon.</i>	64
FOREIGN CORRESPONDENCE:—London Letter..... <i>W. Watson.</i>	66
CULTURAL DEPARTMENT:—New Chrysanthemums..... <i>J. N. Gerard.</i>	67
Potting Ferns..... <i>W. H. Taplin.</i>	67
Growing Early Strawberries..... <i>O. W. Blacknall.</i>	68
Early Peas..... <i>Professor W. F. Massey.</i>	68
Lithospermum prostratum..... <i>T. D. H.</i>	68
CORRESPONDENCE:—In the Shore Towns of Massachusetts.—VI. <i>J. B. Harrison.</i>	69
Forests and the Flow of Streams—An Eighteenth Century Opinion.... <i>F. S.</i>	70
MEETINGS OF SOCIETIES:—The Western New York Horticultural Society.—II.....	70
Our Autumn Foliage..... <i>Wm. McMillan.</i>	70
How to Obtain More High-grade Fruit..... <i>George T. Powell.</i>	71
The Toxicology of the Copper Compounds when Applied as Fungicides, <i>Professor D. G. Fairchild.</i>	71
NOTES.....	71
ILLUSTRATIONS:—Colonial Summer-houses, Fig. 12.....	65

Parks for Growing Cities.

THE article by Mr. Baxter in another column referring to the proposed metropolitan system of parks for Boston has more than a local interest. Our rapidly growing cities will all be compelled, sooner or later, to face the problem of providing ground for public use, and the sooner the problem receives careful study the more perfectly and economically can the necessities of cities in this matter be met. There is no longer any need of argument to prove that ample and convenient open spaces for public resort and recreation are essential not only to the pleasure and comfort, but to the physical health and the mental and moral growth of the people. This is universally admitted. Twenty-five years ago the case was different. Men of high professional repute in this city, even as late as seven or eight years after the act to create Central Park had been passed, argued that additional pleasure-grounds would only offer more space for riot and disturbance; that no police force could preserve decency and order in such broad areas, where the lowest denizens of the city would congregate; that no gentleman would ever visit the park or allow his wife and daughters to go there.

No man in his right mind can now be found who harbors opinions of this sort. The park questions with which public-spirited men now concern themselves are, how to secure enough land, how best to adapt it to public use, and how to maintain and administer it most effectively for that end. These questions are growing more urgent because of the rapid increase of our urban population as compared with that of the whole country. In some states there are actually fewer people on the farms than there were ten years ago, and the cities now contain more than half of our entire population. This tendency is likely to be stronger for years to come, and the abandonment of the country makes it more necessary to supply the town with some of the country's advantages. In most cases the expansion of our cities outstrips prophecy, and [outlying districts are swal-

lowed up before any preparation is made for their future. Before any one realizes that a park may be needed the lands have become so valuable that the cost of any area spacious enough to give the city visitor a sense of enlarged freedom is appalling. The danger of delay in this matter is illustrated by the example of the cluster of large cities in New Jersey, just across the Hudson. Neither Newark, Jersey City, Elizabeth nor Paterson has any park worthy of the name. No doubt, it would pay even now to acquire land within reach of the centres of population in all of these cities, but had this been done twenty years ago a comparatively trifling expenditure would have been needed and the investment would have been paying liberal returns in the comfort, health and business prosperity of their population. If action is delayed twenty years longer there is little hope that any adequate provision for public pleasure-grounds will be made here until the cities are forced to demolish solid blocks of buildings to make room for grass and trees.

Nearly thirty years ago, in their report on the design of Prospect Park, in Brooklyn, Messrs. Olmsted, Vaux & Co. indicated on a map the beginning of a road from the southern entrance of the park, and made a suggestion that it should be a shaded pleasure-drive, and practically an extension of the park. Without laying down the course of this parkway, the designers stated that the ocean-beach would be its natural terminus, and it was added that a similar road might be carried through the rich country lying back of Brooklyn until it could be turned without striking through any densely occupied ground so as to reach the shore of the East River at Ravenswood. From this point, over high bridges thrown across the narrow straits into which the river is here divided, the parkway could be carried through a broad street directly into Central Park, beyond which was to stretch a system of sylvan roads leading to the northward. Such an arrangement would enable a man to drive in half a summer's day through the most interesting parts of Brooklyn and New York, their most characteristic suburbs and both of their great parks, with the long stretch of the Hudson, the Palisades in the middle distance, and the mountain-range in the background for a prospect at one end, and the foaming breakers of the Atlantic at the other, and "the whole might be taken in a circuit without crossing the same ground, and would form a grand municipal promenade hardly surpassed in the world for extent or continuity of interest." If this project had been promptly carried out that drive might have been taken now under trees of stately proportions. It is hardly possible now that any comprehensive scheme of this character, or like the one outlined for the greater Boston, can ever be adopted by the cities in New Jersey; but there has been a time when a system of parks and parkways might have easily been designed to link together the heights of Bergen, the Palisades and the Orange Mountains. This could have been done without occupying as large a park area, in proportion to the size and probable population of the combined cities in the year 1900, as London has to-day.

In many cities it would not be possible to secure a continuous line of parks and parkways, but there are many other advantages of a single plan on a comprehensive scale. All the varied wants that are supplied by open spaces can be met in this way alone. Every large city could have its ample tree-bordered avenue for festal meeting and procession, its zoölogical and botanic garden, its parade-ground, its children's playgrounds, with places for public meetings and ceremonies, music and fireworks, not to speak of sequestered gardens and broad, simple pastoral scenery, besides special features which the peculiar conditions of each city might offer. It is encouraging to know that the movement in Boston has begun before the opportunity for this magnificent provision for the future is lost. It is to be hoped that this example will be infectious, and that many other cities will arouse themselves to take decisive action in a similar direction.

IN the report of the Honorable Thomas H. Carter, Commissioner of the General Land Office, for last year, attention is again invited to the rapidity with which the most valuable timber on the public lands is being exhausted, and it is once more shown that the land laws are inadequate to protect either the public forests from unlawful appropriation or the interests of settlers in their legitimate use of public timber. The laws passed last year will help to remedy some of the evils, but there is need of a general law to ensure equal rights and uniform privileges without any discrimination as to localities or industries. Mr. Carter suggests that one provision of such a law might be to empower the legislatures of the several states and territories to enact laws not in conflict with the act of Congress to govern and control the cutting and disposition of timber on the public domain. He thinks this would bring the local government to the aid of the general Government in such a way as to be helpful. He also holds that there should be provisions in the general law to facilitate the acquisition of title by actual settlers on agricultural land to a limited area of timber-land, so that each individual could guard his own timber. Provisions of this nature should certainly be made cautiously, for there is nothing in our experience to show that either the states or individuals will exercise any care in preserving the woods. It is true that the general Government itself has never done anything to inspire confidence that there is any promise of safety for the forests while under national control, but the proposition that some carefully considered general law relating to public timber should be enacted is one that every intelligent man in the country will admit without argument. Such a law will not be fully enforced until there is a thoroughly educated public sentiment behind it, but the passage of the act will be one of the most potent influences in developing this sentiment.

The Boston Metropolitan Park Movement.

THE park system of the city of Boston, though far from complete, has educated the public to the value of parks, and a definite movement for a metropolitan park system has at last been set on foot. Chief among the factors that have aroused popular interest in the subject are the agitation in behalf of a public forest-reservation at the Middlesex Falls, the agitation relating to the Blue Hills, instituted through the medium of GARDEN AND FOREST, the example of Lynn in creating its noble public forest, the incorporation of the Trustees of Public Reservations, together with the quickened consciousness of the need of extensive provision for breathing-spaces and the preservation of features of landscape interest throughout the region over which an urban population is rapidly spreading.

Throughout the state of Massachusetts there is now a marked interest in park-improvements. A large number of the cities and several of the towns have taken action under the general park law. The majority of the cities and towns within an eleven-mile radius of the Boston City Hall have accepted the provisions of the act by popular vote, as required, and have either appointed park commissioners, or are about to do so.

But even if all these neighboring cities and towns should be favorably disposed, they could hardly act co-ordinately for a single park system without special legislation.

The Trustees of Public Reservations, in their efforts to gain possession of the beautiful tract in Belmont containing the Waverley Oaks, found that it was impracticable to obtain title by purchase, owing to the complicated ownership. The preservation of these noble trees could be assured only by exercising the right of eminent domain, and the metropolitan park system offered the best method to meet the case.

Therefore, by co-operation with the Boston Board of Park Commissioners, the Trustees of Public Reservations invited to a meeting the park commissioners and other leading officials of the several cities and towns in the metropolitan region, together with other persons interested. At this meeting Mr. Charles Eliot, Secretary of the Trustees of Public Reservations, made a clear statement, showing how little use had been made of the remarkable natural advantages of diversified scenery offered by harbor and sea-shore around Boston. The growth of the metropolitan population to nearly a million

people, and its rapid increase, made it essential to adopt practical measures for setting aside more ground for the public.

The conference was unanimous that action should be taken in a comprehensive way. A committee was appointed to petition the Legislature and to devise some plan for a permanent organization. Governor Russell is known to favor the object, and the Mayor of Boston endorsed it in his inaugural, and the appointment of a metropolitan park commission seems probable.

The most desirable points to secure will be the reservation of large tracts for public forests like the Blue Hills and the Middlesex Fells; the preservation of the sylvan and rural character of the river margins, and of the beautiful salt-marshes and the neighboring uplands of the tidal basins of the Charles, Mystic and Neponset rivers, so far as practicable; the taking of picturesque and historic spots and points of view like the Waverley Oaks, and the holding of the sea-shore for the public.

One gratifying fact made known at the conference was that Nahant Beach and the beach between Little Nahant and the main peninsula are the property of the town, and Mr. Frederick Law Olmsted has been requested to make a design for their improvement. These beaches form long and narrow necks of sand, connecting the two portions of Nahant with the mainland, like islands with a gigantic mooring. On one side beats the surf of the open ocean, on the other are the quiet waters of Lynn harbor. The highway runs along the crest of the beaches, and that is the reason why they are town property. The views from these beaches form one of the most beautiful, varied and extensive panoramas to be seen along the Atlantic coast. Lynn, with its background of rocky wooded hills, is particularly beautiful from these beaches. It was at his summer home at Nahant where Longfellow wrote "The Bells of Lynn."

The Park Commissioners of Lynn, besides the great Lynn Woods and the improvement of Meadow Park, which they are converting from a mud-hole into a playground in the heart of the city, also propose to give the Nahant beaches improvement a worthy terminus by laying out an ocean-side plaza at the point where the Nahant Drive meets the mainland.

A proposition was made to restore the forest-mantle, so far as practicable, to the islands in Boston harbor. The islands and mainland shores were originally well wooded. The trees were cut away, and the hope of any renewed growth was destroyed by pasturing the islands. Except on the southerly shore, the beauty of the harbor is marred by the bald, inhospitable look of the islands, with their hard, monotonous contours.

The Park Commissioners considered the question of reforesting these islands several years ago, and Mr. Olmsted made a valuable report on the matter. It was found that an expenditure of a few thousand dollars a year for a few years would restore the woods, so as to give agreeable diversity to the harbor landscape. A majority of the islands are owned by the city, and most of the owners of the others promised co-operation. The proposition was received with great favor, but it was killed at the City Hall. This result of municipal politics is to be lamented, for even one or two seasons' growth would have worked a transformation in the islands, and by this time their beauty would have been established.

The securing of the Middlesex Fells region as a public forest-domain will be made easier from the fact that various towns have enlarged their public holdings here in order to protect from pollution the historic Spot Pond, which furnishes their water-supply, and these, with other water-basins secured, amount altogether to something like 1,000 acres of picturesque land, much of it well wooded. The town of Stoneham has taken Bear Hill, the highest elevation in the Fells, and proposes to take Taylor Mountain, a continuation of the Bear Hill ridge. Finally, the Trustees of Public Reservations have received as their first trust the Virginia Woods, a fine tract of twenty acres, covered with an old growth of Hemlock and White Pine, lying between the Ravine and Wyoming roads that approach Spot Pond from Melrose, and a fund of \$2,000 has been raised by subscription to care for it.

Finally, Mr. Walter Wright, a son of the late Hon. Elizur Wright, who was the father of the Middlesex Fells project, proposes to give for public uses, in accordance with his father's intention, as an experimental forest, a handsome tract, mostly of White Pine, on Pine Hill, in Medford.

Altogether there are between 1,300 and 1,500 acres, out of 4,000 in the entire region, now assured to public use in the Middlesex Fells. What is needed is to connect the various scattered public holdings, make them convenient of access, secure certain important features that still remain pri-

vate property, like the lovely cascades in the easterly margin, and bring all under a uniform system of administration. This can best be done under the proposed metropolitan park administration.

Boston.
Sylvester Baxter.

Colonial Summer-houses.

AMONG other revivals of old-time usages prevalent during this decade it is surprising not to see some creations resembling the old summer-houses, so much used and admired from fifty to one hundred and fifty years ago on many estates in the older-settled portions of our country. As far as I am aware, the restoration of a few remaining old ones has been the only effort made in this way. These structures were what their name implies—houses for summer. Intended for use during warm weather, when artificial heat was not wanted, they were usually built and finished in a manner to correspond with the best rooms in the houses to which they were adjuncts; indeed, they must often have been superior in their ornamentation and furnishings. Chippendale furniture of the purest design and delicate construction found an appropriate setting in some of them, and in the coast towns, when their owners were also ship-owners, they were sometimes furnished with Teak-wood furniture and those wonderfully artistic pieces from India and China, beside which modern importations look so inferior. The Mediterranean countries were also contributors, and decorations in marble and Italian glass could be found. Often there were delicate chandeliers and tall candlesticks, surrounded by still taller glass shades, like those used in the West Indies, for a free circulation of summer air was desired, and the dripping of wax was thus prevented.

Musical parties were a favorite form of entertainment held in these summer-houses, and on other occasions the supper was served in them, when they were brilliantly lighted and decorated. What we call lawn and garden parties were not then in vogue, but ladies' luncheons were often given in the summer-house, and, no doubt, were as enjoyable as any now held. The ladies often used them as morning and reception rooms, and delightful they were for spinning, reading or needlework, or to receive friends apart from the work of the domestic establishment.

The young people and lovers were especially appreciative of their attractions, and many interesting tales could be told of famous people who arranged the important affairs of their lives within these sheltering walls. Before writing upon walls and window-panes had reached its present vulgarity, inscriptions and couplets were often composed in these abodes of summer life. Even the great Washington and his generals are said to have enriched some little panes of glass with their autographs. The practice was a direct continuation from an even earlier time, as it was on the window of a summer-house that Leicester wrote:

Fain would I climb, yet fear I to fall.

And Elizabeth wrote under it:

If thy heart fail thee, climb not at all.

In the hands of less exalted or witty personages, however, the practice soon degenerates into mere scribbling, and it has no good reason for revival or survival.

But there is something to be said, however, in favor of these attractive little structures. They largely occupied the sphere of the present piazza and summer parlor. With the appearance of the modern piazza they went out of fashion, and, to some extent, their office is filled by arbors and rustic shelters, but these belong more properly to somewhat distant and less frequented portions of the grounds. The true summer-house, although often arranged with windows to overlook the beauty of land and water, is an attraction in itself, adapted to highly cultivated and artificial surroundings, even to gardens of small extent.

It is for use as a detached portion of the house rather than an independent structure. It should be retired, but not far distant, and should correspond in architectural features with the main structure. There are some dwellings upon which it is difficult or undesirable to have the usual piazza, especially in mountain districts, where frequent rains make it desirable to have the sunshine directly upon the house, and in foggy situations near the ocean, where dampness makes the piazza objectionable. It is often hard to build an addition to a building already completed, and the problem might be solved and additional room furnished by a disconnected building that would answer every purpose and add to the attraction of many establishments. Afternoon teas and strawberry parties can be delightfully managed from them, and they lend themselves gracefully for all kinds of floral decorations.

The illustrations on page 65 are from examples still remaining in Rhode Island, and show our ancestors' taste, although these are less ornate and smaller than some formerly in existence. They are all of one story, although we have heard of those which had two. They are built of wood, and the workmanship is of a high order. The roof-line in two of them has received careful consideration, and adds much to their picturesqueness. In the third, however, the upper part is inferior in design. This is the one with the flight of steps, and it is built upon a huge boulder in the garden of Wm. B. De Wolf, in Bristol, where it has weathered the memorable gales of 1815 and 1869. A carved figure of an Indian with a tomahawk surmounts the centre of the roof. A figure of a cavalier occupies the same position on the second, which also stands in Bristol, and for many years overlooked the harbor from its position in a terraced garden, which is said to have had great beauty, and situated directly upon the shore of Narragansett Bay. A high carved fence, surmounted with wooden urns, separated the garden from the highway, and other carvings ornamented the grounds, which were of the era when not only Sir Timothy Dexter, but all of New England, admired decorations of this sort. The larger house on the left is in the garden of Mrs. E. S. Diman, now in Providence, but once famous as Rose Farm, with its beautiful grounds. The building is large and commodious, showing the same care in construction and delicate finish as the others, in cornice and other details. The foundation is of cut freestone, and underneath is a well-paved store-room that has been in use for several generations. Our modern architects could doubtless design structures with all the attractions of the old ones, and adapted to the requirements of modern life, if a desire for them was manifested.

New York.

John De Wolf.

Notes of a Summer Journey in Europe.—VI.

THE botanic garden at Leipzig has, within a few years, been removed from its old location to entirely new grounds, so that none of its trees are large. Owing to the limited area they are also much crowded, and can never become finely developed. The collection here is said to contain about six hundred species and varieties of trees and shrubs. As at Munich, it is found impossible to grow good specimens of conifers.

The park called the "Rosenthal" is a pleasant, restful recreation-ground of meadow and woodland, generally free from artificial embellishments, and with no more drive-ways than seem absolutely necessary. Many of the trees in the park have attained to a large size. The European Hornbeam (*Carpinus Betulus*) is here planted with the Common Elm (*Ulmus campestris*), forming fine broad spreading trees, almost equaling the Elms in height, and with trunks two feet in diameter. Among American trees noted were some good Hickories and fine typical specimens of the Pin Oak (*Quercus palustris*), with trunks a foot in diameter. The stems of exposed trees on the streets are protected by coarse basket-work, five or six feet high, which answers very well as a guard and is cheaper and less liable to injure the trees than many more elaborate contrivances.

From Leipzig to the old town of Merseburg, by way of Halle, need not take more than an hour by the railroad, and a brisk walk of an hour and a half from Merseburg brought me to the little village of Zoeschen, where Dr. G. Dieck has established his collections and nurseries. There are some fine avenues of old Horse-chestnuts in Merseburg, and the road to Zoeschen, like most of the roads in this part of the country, is lined on both sides with fruit-trees, principally Cherries, which bear fruit of good quality, but great quantities of Pears, Apples and Plums are also planted. All were bearing heavy crops of fruit, and most of the cherries had already been picked. Sections are sometimes planted in Lindens or other suitable trees. The fruit-trees are planted about twenty-five feet apart, the distance across the road being thirty feet. The country here is flat, with soil too rich and valuable for regular farm-crops to allow much of it being devoted to woodland.

Dr. Dieck has given his establishment the name of "National Arboretum," a title which might easily give a wrong impression of the status and character of the place. It has no connection whatever with the government, being solely the property and enterprise of Dr. Dieck. Besides being a nurseryman and an arboriculturist, Dr. Dieck may be classed as an extreme enthusiast on the subject of trees and shrubs and as a collector of everything that promises to be an addition to his stores. New plants, valuable only for their botanical interest, are collected as eagerly as the showy species, and Dr. Dieck has the reputation of being very generous with his plants to botanical

and other scientific institutions. Collectors are employed in various parts of the continent of Asia, of Japan, of some of the not thoroughly known cooler regions of Europe and North America, wherever it is likely that hardy novelties may be obtained. As the climate of this central German plain is severe in winter, it is the aim of the proprietor of the "National Arboretum" to procure his stocks from the highest latitudes and altitudes or most exposed situations in which they occur in their native habitats. I have spoken of Dr. Dieck's enterprise in collecting, because he is apparently trying to do a work in Germany similar to what the Messrs. Veitch have long been doing, in introducing new plants to English gardens.

The grounds in the immediate vicinity of the house are filled with various trees and shrubs, with small nursery material, and particularly with the newer and rarer acquisitions. An idea of the pains taken in bringing the collections together may be gained by the statement that it is claimed there are about 500 species and natural variations of wild Roses here, and an equal number of forms of Willows. But, besides being torments to systematic botanists, the great majority of these variations or hybrids are of no particular value either for use or ornament. The custom of giving Latinized names to garden-hybrids, or the merest variations, is also to be deplored, as tending to create greater confusion in the nomenclature and synonymy of already well-defined species. An interesting hybrid was one between *Rosa Beggeriana* and *R. rugosa*, which produces rose-colored flowers from the tips of its shoots throughout the season, as is the habit of *R. Beggeriana*. Great pains have also been taken to introduce the kinds of Roses from which attar of roses is produced, and some account of these forms is given in the catalogues.

A shrubby *Polygonum* from Afghanistan may prove to be an interesting addition to our gardens should it be found sufficiently hardy. *Rhododendron Ungerni*, from the mountains of Armenia, is considered another great acquisition, as it gives promise of being quite hardy. The leaves are very white on the under surfaces. One or two other novelties in *Rhododendrons* are also promised. *Hedysarum multijugum*, from Mongolia, is here quite hardy, forming a straggling shrub five feet high. A white-flowered *Cytisus* from the Balkans is much prized.

The raising of *Coniferæ* and *Ericacæ* from seed is not any easier here than we find it in America, as the young seedlings are just as liable to sudden and wholesale destruction by fungi unless great care and watchfulness is exercised. During the first years, or until they have attained to a good size and strength, the young evergreens and plants of the Heath family are sheltered from the direct rays of the sun by very loose mats made of coarse reeds or grasses placed on frames which are sufficiently elevated to admit of free passing beneath.

The main nurseries are divided into several large and quite separate blocks of many acres in extent, perhaps comprising about 125 acres in all. Ornamental, shade and fruit trees are grown. A large portion of the fruit and shade trees produced here are grown with straight clean stems, without branches for six or seven feet or more, to meet the great demand for trees for road-side planting. Among the conifers there were a number of species, generally considered thoroughly hardy in regions much colder, which showed some injury from the frosts of the last winter. Many young Spruces were greatly injured by a species of Spruce-bud louse, probably *Chermes (Adelges) abietis*, which causes cone-like swellings on the tips of the shoots and branchlets. It is the same or a closely allied insect which often attacks and seriously injures Norway, White and other Spruces in our own country. There seems to be no remedy except cutting off the infested tips as soon as they appear and burning them at once, instead of throwing them on the ground, where the insects would probably be able to complete their development. It is noticeable that trees in vigorous health are apparently less affected than those which make poor growths or are in uncongenial situations.

This insect came under my notice in a curious way when on the Rigi, in Switzerland. A great deal of buzzing overhead among the branches of some Spruces proved, on examination, to be caused by swarms of bees, wasps and flies which had been attracted by the liquid excretions or honey-dew made by great numbers of chermes with which the trees were infested.

Between Halle and Berlin the train passes many more large tracts of forest, and here we find the Scotch Pine (*Pinus sylvestris*) chiefly planted. As a rule, only the poorest land is planted in wood, and its poverty is often attested by the White Birches, which spring up among the Pines where there are favorable conditions. The Pines looked in good thrifty condition, and over large tracts the trunk of every one was encir-

led by a band intended to prevent inroads by certain injurious insects.

As would naturally be expected at the capital of the empire, the Botanic Garden at Berlin is one of the best of these German public institutions. Besides the collections of living plants, it has connected with it a very excellent botanical museum, which is open to the public on certain days in the week, and which cannot fail to be almost as instructive as the garden. The collection is especially rich in representing trees and the more useful plants and their products.

Of the plants in the garden it seems hardly necessary to speak in detail, as there is a good deal of similarity, both in arrangement and specimens, in many of these institutions. In naming the specimens the Latin name and authority, the German name and the native country are given on the labels.

The present director has given the Alpine Garden a prominent place here, some fine trees having been sacrificed to it. The trees in the garden are generally rather crowded, but there are some large well-developed specimens among them. A specimen of a form of the Oriental Plane-tree has a trunk approaching five feet in diameter at two or three feet from the ground, and shows no signs of disease.

The Oregon Ash (*Fraxinus Oregana*) was noticed, about twenty-five feet high, growing vigorously and fruiting freely.

The mystery which surrounds the origin of the Myrobalan Plum (*Prunus Myrobalana*) was here recalled by a large broad spreading tree, thirty feet high, labeled under the synonym *Prunus cerasifera*, and with North America credited as its natural habitat. Most horticultural works, as well as other gardens, almost uniformly attribute this species to North America, and it is strange that it has not yet been found wild by American botanists if it is a native of this country.

The evidence seems to point to south-western Asia as its natural home. Seeds, without name, which were sent to the Arboretum by Max Leichtlin, and said to have been collected in Turkistan, produced plants of this species which bore yellow fruit. It is true that this seed may have been wrongly labeled by mistake, or the plants from which the seed was collected may have been introduced and not been indigenous to Turkistan. Another point in favor of the idea that it is a native of Asia is that we have in what is called *Prunus Pissardi* in many nurseries a plant which is evidently a form of the Myrobalan Plum, and already it is to be found in gardens and catalogues under the name of *Prunus cerasifera, foliis purpureis*, or *P. cerasifera, Pissardi*.

Whence this came to Europe is known, for it is recorded that it was first sent to France by Monsieur Pissard from the capital of Persia, the sender being at that time gardener to the Shah.

Seeds of this purple-leaved Plum have been sown and the young plants derived have agreed exactly, in every essential particular, with plants of the true Myrobalan Plum of the same age, the leaves of the seedlings being of the natural green color.

It is to be hoped that Dr. Dieck, Max Leichtlin or some other of the enterprising botanical explorers of south-eastern and central Asia, may soon be enabled to enlighten us as to the true home of the wild Myrobalan Plum.

Arnold Arboretum.

J. G. Jack.

Notes on Cone-bearers of North-west America.—I.

MISNAMED CALIFORNIA PINES.—Two species of Pines belonging to the close-cone group are bearing in our present Pine literature untenable names. I allude to the Monterey Pine and the Narrow-cone Pine, called *Pinus insignis* and *P. tuberculata* respectively. The first was named more than one hundred years ago by one of the earliest botanists to deal with California plants.

PINUS CALIFORNICA, Loiseleur, in *Nouveau Dubamel*, vol. v., 243 (1816), in part, excluding characters of the seeds.

P. tuberculata, D. Don, in *Trans. Linn. Soc.*, xvii., 441 (1837), and

P. radiata, D. Don, l. c. 442.

P. insignis, Douglas, in Loudon's *Arboretum* (1844), and most subsequent authors.

The name conferred by Loiseleur de Longchamp in 1787 (published l. c. in 1816) was accepted by such eminent botanists as Loudon, Endlicher, Hooker & Arnott, Nuttall, Carrière, etc., but was not taken up by most other authors, perhaps on account of an error in the description of the seeds, due to mixing of specimens.

However, under the laws of botanical nomenclature, adopted by the International Congress at Paris, 1867, the Article 49 (with remark under it) requires that Loiseleur's name be restored, inasmuch as he sufficiently distinguished the species, and, fortunately, *Californica* is a very appropriate name for the first-described California Pine.

The treatment of the other species—the Narrow-cone Pine—must be more radical, involving the coining of a new name, *Pinus attenuata*. *P. tuberculata*, Gordon, in *Jour. Hort. Soc., London*, iv., 218 and f. (1844), and subsequent publications.

Mr. Gordon described correctly, and was the first author to do so, the Narrow-cone Pine, which he supposed was the same as the one described from meagre data, and named *P. tuberculata* by Don (l. c.); but that Pine was a small-coned form of the Monterey Pine, as the figure in Lambert's *Pinus*, 1st ed., iii., 131, t. 85, plainly shows, and it is so cited by recent authors, hence the name *tuberculata* was misapplied unintentionally to this abundantly distinct species, which may now bear the name *attenuata*.

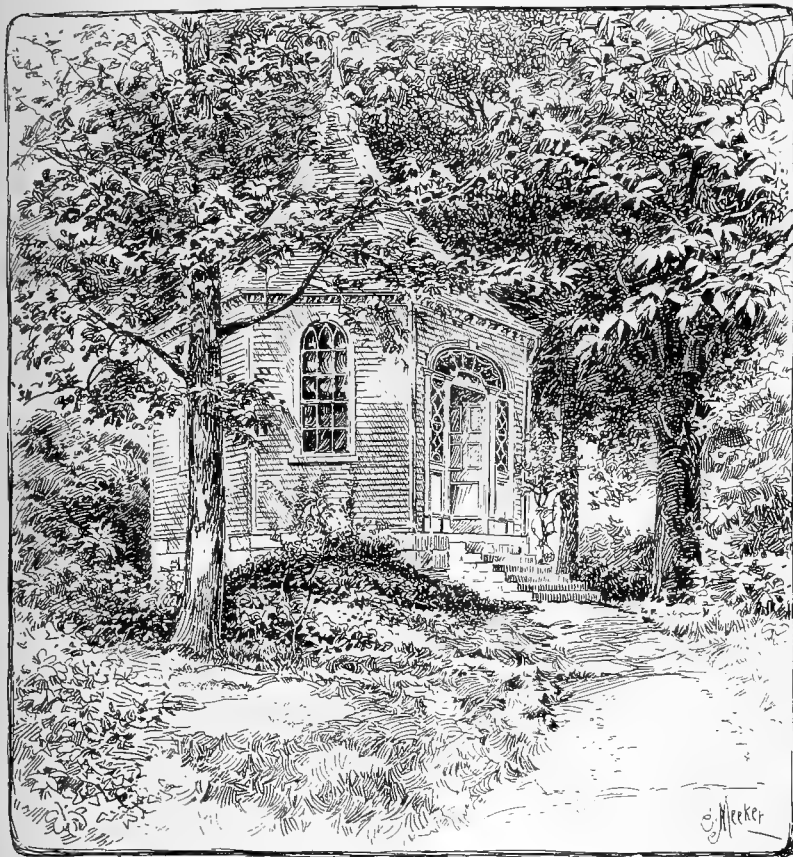
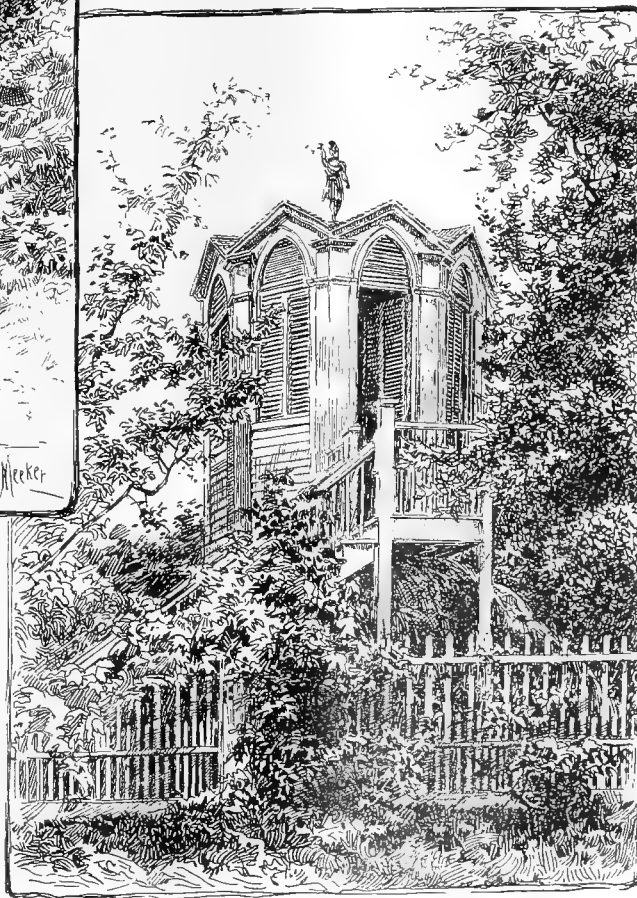


Fig. 12.—Colonial Summer-houses.—See page 63.

suggested by the tapering cones as well as the slender habit of the trees when found in groves. † *J. G. Lemmon*.
Oakland, Cal.

[It is possible that the plant described by Loiseleur as *Pinus Californiana* (not *Californica*) may be identical with the species now commonly known as *Pinus insignis*. The fact that the specimen upon which Loiseleur's species was founded was gathered at Monterey points to this conclusion. But the seeds of *Pinus insignis* are not edible, as he represented them, and his description is so unsatisfactory and faulty that it is impossible to recognize absolutely from it the species he intended. Under these circumstances the only safe way is to pass over Loiseleur's name entirely. This was the conclusion reached by Dr. Engelmann (see Brewer & Watson, *Botany of California*, ii., 127), who also discarded as too uncertain the *Pinus adunca* of



Bosc (*Cat. Hort. Paris*, 247), first published in 1816 by Poiret (*Lam. Dict. Suppl.*, iv., 418). The oldest name of whose identity there can be no question is therefore *Pinus tuberculata* of Don, and this, it would seem, must be taken

up in place of the much later *Pinus insignis* of Douglas, although it has, unfortunately, been long associated with another species, the *Pinus tuberculata* of Gordon, now to be known by Mr. Lemmon's name of *Pinus attenuata*.—Ed.]

Foreign Correspondence.

London Letter.

THRINAX MORRISII.—This is a new species of Palm which the Assistant Director at Kew, Mr. Morris, discovered in Anguilla, one of the Leeward Islands, when on a visit there last year. He brought back with him stems, leaves and fruits, from which Herr Wendland has made his description. Subsequently, good seeds were obtained for sowing at Kew. It differs from all other species of the genus, in being of very small stature, rivaling in this respect *Phoenix Roebeleni*, the pigmy Date, which was figured in GARDEN AND FOREST a year or so ago. In the *Kew Bulletin*, for May last year, Mr. Morris stated that :

"Before arriving at Blowing Point (in Anguilla) an interesting little Palm was found growing on broken limestone rocks. It was present in fairly large quantities, and the fan-shaped leaves were used for thatching native huts. The chief interest attached to this Palm is connected with its dwarf habit. The largest and most mature specimen did not measure more than about thirty or thirty-five inches in height, and the stem was about two and a half inches in diameter. . . . There is little doubt it will prove most attractive and interesting in a horticultural sense."

The species of *Thrinax* which finds most favor in England is *T. elegans*, sometimes called *T. Barbadosensis*, sometimes *T. Loddigesii*, but which ought properly to be called *T. radiata*. It forms a pretty pot-plant when small, and when large is one of the handsomest of the smaller fan-Palms, the elegant leaves clothing the stem almost from top to bottom, even in tall specimens. *T. excelsa*, *T. parviflora* and *T. argentea* are also exceedingly handsome. There are splendid specimens of these in the Palm-house at Kew. With reference to the exceptionally dwarf character of *T. Morrisii*, it is just possible that under conditions less exposed and more favorable than those under which Mr. Morris found this species, it may grow much larger than any seen in Anguilla. I know this happens with some kinds of *Phoenix*.

CHILD'S NEW JAPANESE WINEBERRY.—Under this name a plant is advertised, this week, by an American nurseryman in some of the London horticultural journals. It is described as a bush five to seven feet in height, and as being able to "stand alike the cold of northern winters and the heat of tropical summers without the slightest degree of injury." Judging from this description and the picture of the plant which accompanies it in the advertisement, I have no doubt that the plant meant is the Japanese *Rubus phoenicolasius*, which was introduced from Japan into Europe by Dr. Maximowicz. A plant of it was obtained from the Jardin des Plantes, Paris, for Kew in 1875, from which a picture was made and published in the *Botanical Magazine* in 1880 (t. 6479). For the first year the plant at Kew grew outside among the collection of hardy Rubi, where it was nearly killed by the cold of the succeeding winter. It was then removed to a sunny position in the large temperate house, where it grew luxuriantly. Here it assumed the habit of a very tall Raspberry, the shoots growing to a height of ten feet or more. They were fastened to a pole. In summer the plant flowered freely, and the flowers were succeeded by a fine crop of shining scarlet fruit, scarcely as large as an ordinary raspberry. The fruits remained on the plant until midwinter. They were fit to eat, but mawkish and inferior in flavor to blackberries. The flowers are small, the petals pinkish, with long calyx lobes, which fold over the young fruit, expanding again as the berries ripen. The stems, petioles, midrib of the leaf on the under side, together with the flower-stalks and calyx-lobes, are clothed with long, stiff, gland-tipped red-

purple hairs; there are a few spines at the base of the ripened stems. These hairs are, perhaps, the most ornamental feature of this species of *Rubus*, although the fruit, when ripe, is attractive. With regard to the statement that it will "stand the cold of a northern winter without injury," I should say that it depends on what is meant by "northern" and "winter." Certainly the plant is not hardy at Kew, where it is still grown in the temperate house.

[There is no doubt about the ability of this *Rubus* to endure the winter climate of New York and its vicinity. Plants stand out here with no protection, and are perfectly hardy. It is quite possible that the seeds sent to Europe by Dr. Maximowicz came from a more southern region than those from which the strain offered by Mr. Childs were grown. Professor Georgeson collected these seeds in the mountains of northern Japan. It is probable, too, that there is as great a difference in the quality of the fruit of different plants as there is in their hardiness. The berries we have tasted are by no means "mawkish."—Ed.]

CATTLEYA LABIATA VERA.—A somewhat novel method of subscribing to a charitable institution was adopted lately by Messrs. F. Sander & Co., who placed in the hands of an auctioneer a large newly imported specimen plant of this *Cattleya* to be sold for the benefit of the Gardeners' Orphan Fund. The plant was a magnificent one, having over 250 healthy pseudo-bulbs, forming a mass more than a yard through. It realized fifty guineas, a price which, under the circumstances, may be called a fancy one, really good plants of this *Cattleya* being now obtainable in England or Belgium for about five shillings each. Such a specimen as the above would be probably fifty years old at least. Messrs. Sander & Co. have promised to give a full and complete account of the discovery of this *Cattleya* in the forthcoming number of *Reichenbachia*.

The Gardeners' Benevolent Institution was established about fifty years ago for the purpose of assisting aged and infirm gardeners who were unprovided for in any other way. The subscription for gardeners is a guinea a year, but by far the largest proportion of the funds are contributed by wealthy sympathizers. Upward of \$275,000 have been distributed in pensions and gratuities since the institution was started, the sum disbursed last year amounting to \$13,700. While preference is given in the election of pensioners to those who have subscribed, a considerable number of those who enjoy the benefits of the institution have been elected on the recommendation of liberal subscribers. The sum granted per week to each pensioner is four dollars for a man, three dollars for a woman. Last year a pensioner died at the age of 103. He had been in receipt of assistance from this institution for over thirty years. Members who have subscribed one guinea annually for fifteen years are, on attaining a certain age, entitled to a pension without taking their chance in an election. The good work done by an institution of this kind is too apparent to need comment. With this to look after the comfort of the aged gardeners, and an equally zealous and beneficial body of a similar nature—the Gardeners' Orphan Fund Committee—to provide for and educate the orphan children of gardeners, the cause of the needy among those who practice horticulture in England does not go uncared for.

W. H. FITCH.—Any one familiar with the English botanical literature of the last half-century will be acquainted with the name or initials of this botanical artist, who for about forty years was the acknowledged first botanical draughtsman in the world. His death, which occurred at Kew on the 14th instant after an illness of over two years, has served to call attention to the enormous amount of valuable work he did. He was a Scotchman, having been born in Glasgow in 1817, where he was employed as a boy in a printing-house. His early promise as a draughtsman was the means of bringing him to the notice of Sir William Hooker, at that time Professor of Botany at Glasgow University, and young Fitch was engaged by him to assist

him privately. When Sir W. Hooker was appointed Director of Kew, in 1841, he brought Fitch with him. Here he soon found scope for his skill in the preparation of botanical illustrations of all kinds. He made the plate for Hooker's *Icones Plantarum* from the commencement (1837), and soon afterward took over the entire work of plate-drawing for the *Botanical Magazine*, for which he was sole artist for a period extending over forty years. He made the illustrations for all the principal publications prepared at Kew up to within a few years of his death. The splendid folios by Sir Joseph Hooker on Himalayan Plants and Himalayan Rhododendrons; the six quarto volumes which were the result of Sir James Ross's Antarctic expedition; the *Botany of the Herald*; the *Flora Vitiensis*; Bateman's *Odontoglossums*; Elwes' *Monograph of Lilies*; Saunder's *Refugium*; Howard's *Cinchonas*—these contain some of his best work. He also prepared the illustrations for the botany of the Speke and Grant expedition, published in the *Transactions of the Linnean Society*, and for Welwitsch's plants, published in the same periodical. All the numerous pictures of Ferns published by Sir W. Hooker were by Fitch's hand. His fidelity to nature, the judgment he exhibited in bringing into prominence those details which in botany are of primary importance, although art of the popular kind would hide or ignore them; the picturesque arrangement of his subject, the accuracy of outline, perspective and color—these were some of the points in which Fitch excelled. His eight magnificent illustrations of the *Victoria regia*, prepared for the Elephant folio devoted to this plant by Sir William Hooker and published in 1851, are among the best examples of his picturesque work. He obtained a Government pension of £100 a few years ago.

London.

W. Watson.

Cultural Department.

New Chrysanthemums.

ONE of the most striking things connected with the present passion for Chrysanthemums is the almost universal passion for change. The fancier may be faithful to the species, but he is certainly very fickle in his attention to individual kinds; and constant and unceasing change in the varieties grown, and not always for the better, seems to be the rule. Amateur cultivators of other flowers, while testing new varieties, will grow the old ones year after year for a lifetime, but looking back for the last decade, there will be found very few Japanese Chrysanthemums in the lists of that time which are now much esteemed or grown, while in this country the most popular varieties are mostly of home production or imported more recently from Japan. The French varieties which preponderated no longer than five years ago are gradually disappearing from the lists, and new ones excite little attention here, except in special cases. American kinds are also making their way in the world at large, though it took the foreigner a remarkably long time to discover their merits. It is scarcely five years since one of the leading English growers and dealers wrote me that he had seen only one good Chrysanthemum from America. To-day they are appearing on the prize-stands, and gain certificates in what seems the most erratic way.

From the lists of new varieties now appearing, it is pleasant to know that the most ardent desire for change can be gratified. I have not counted the number of new varieties offered from various sources, but from a careful estimate I think that a fairly full collection of the new kinds could be secured for something over \$400—not an excessive amount for a fad, but a striking contrast to the condition of things a few years ago. Most interested growers have already made notes of the promising kinds desired, and it is perhaps not expedient to express an opinion as to the merits of the productions of one's neighbors; it may be said, however, that among the new sorts are a fair number of first-rate kinds with a smaller number with striking distinctness. A few changes of color among some older forms seem the greatest gains—as, for instance, yellow hairy kinds, offered by two growers. A form of this character seems to have been first offered in the United States by an Oakland (California) nursery last year under a Japanese name, and W. A. Manda, from the United States Nurseries, is highly commended.

Abroad, Delaux again offers new varieties of his strain of dwarf early-blooming, large-flowering kinds, at prices ranging from one dollar each to two marvels at six dollars each. This last seems an excessive price for a weak Chrysanthemum-slip, but no plant would seem dear with this description: "Nain, 55 centimètres, fleurs soutenues par de véritables liges de fer, cieme frais imitant la cire, flammées et bordées de rose mouseline; coloris frais et entièrement nouveau dans les Chrysanthèmes. Cette nouvelle venue qui est absolument remontante, surpasse en beauté les plus remarquables variétés d'Automne (!) elle fera sensation dans le monde horticole, où elle est appelée au plus grand avenir, pour la confection des corbeilles, culture en pots pour marchés et pots spécimens pour Exposition." Catalogue-writing seems to be one of the things they do better in France. There is an air of sincerity mixed with enthusiasm, and a struggle to express a mental picture in the above which would convert a brazen image into a buyer, or even impress those who have learned to translate into the vernacular by the light of experience.

Delaux's new strain, however, is said to have proved valuable under him in England, and is worth the attention of any one interested in such flowers. The varieties are said to commence to bloom in April, August, September and October, and to be remontant or successional bloomers, and very dwarf, with large flowers. A few of these were exhibited by Mr. J. H. Spaulding last fall in his general collection, being the first shown in the United States. New breaks and types of flowers are always interesting, and in no family more so than in the Chrysanthemum, especially when one has grown a thousand or more varieties, a large number of which are merely slight variations on others.

Elizabeth, N. J.

J. N. Gerard.

Potting Ferns.

THE month of February is generally a good time for this operation, as a majority of Ferns begin their new growth soon after and the roots become active. To secure strong new fronds the Ferns should be potted before the new growth has made much progress, and this is especially necessary when the ball of earth has to be reduced to avoid the use of large pots. With many of the Adiantums this reducing process may be successfully used before the young fronds are far advanced, and at the same time the worst of the old fronds may be removed, although cutting off all the old fronds at this time may weaken the following growth.

Propagation by division of the crowns is best done at this season; but whenever it is possible to secure them, seedlings make better and more rapidly growing plants. Specimens too large to shift without inconvenience are much benefited by a top-dressing of new compost, and the vigor of Tree-ferns will be increased by wrapping sphagnum around the trunk, the moisture thus applied inducing a fresh outgrowth of roots into the moss, and from thence into the soil below. With the *Gleichenias* the dividing process should have been begun before this, the safest practice being to separate the rhizomes some months before the piece is taken away from the parent-plant, thus giving the young Fern a chance to make some fresh roots before the final removal. The potting material for these beautiful Ferns may be somewhat stiffer than is suitable for many others, and especially for the strong-growing species, such as *G. flabellata* and *G. dichotoma*, while *G. Mendeli*, *G. rupestris* and *G. dicarpa* in its various forms prefer a little more peat. But in all cases abundant drainage should be provided, since the plants have shallow roots, and are impatient of stagnant water.

The Filmy Ferns, of which the various *Hymenophyllums* and *Trichomanes* are the best known, will probably need repotting or top-dressing, and the mixture for this purpose should be rather coarse and open in texture, and should include some pieces of charcoal and broken sandstone, or if that is not at hand some broken brick will answer. Ferns of this class, including the lovely *Todea superba*, should be potted rather high—that is, raised a trifle above the rims of the pots—and should not be disturbed about the roots oftener than is absolutely necessary.

In so large a genus as the Adiantums much difference is found in the requirements of the various species, both in soil and in temperature. For instance, the finest of all the Maiden-hairs, *A. Farleyense*, is best potted in a strong soil composed of good fibrous loam, with a small quantity of sand and a liberal proportion of well-rotted cow-manure. Then, with careful shading and watering, it will soon make a fine specimen. The use of peat for this species seems to be a drawback, while for *A. curvatum* I have found nothing better than coarse peat alone. *A. rhodophyllum* and *A. Victoria*, both of which are

very pretty dwarf-growing species, grow well under the treatment recommended for *A. Farleyense*, and, like the latter, are easily multiplied by separating the crowns and keeping the divided plants in a moderately close house and well shaded to induce fresh growth.

All pots used for Ferns should be clean, new pots being preferable, but in case these are not at hand the old ones should be thoroughly scrubbed before they are used for re-potting, not only for the sake of neatness, but for the well-being of the plants.

Holmesburg, Pa.

W. H. Taplin.

Growing Early Strawberries.

THE following plan which I have followed for years will at a moderate outlay bring strawberries a week earlier, and add to their size and quantity. I use a thin muslin, known here as tobacco cloth or plant-bed cloth. This can be bought at about two cents a yard, and it must be thick enough to shade the plants. This cloth should be stretched over the plants early in the spring before the least growth begins. In North Carolina, March 1st is about the right time. No one can expect the Strawberry-plant to do its best unless protected in winter. Here we use pine-needles, covering the ground half an inch deep. As soon as these are removed, and the manure or fertilizer applied and enough straw replaced around the plants to keep the berries clean, the cloth should go on.

After many experiments in search of a cheap and effective way of holding the cloth in place, I use small sticks of riven pine, known here as tobacco sticks, which are about three quarters of an inch square. These sticks are sawed up into stakes fifteen inches long, and sharpened at one end. The other end for about half-way is smoothed with a drawing-knife and a wood rasp if necessary, so as to remove all splinters and irregularities which could tear the cloth. A very small hole is then bored about one inch from the smooth end. Into this hole a section of small, soft wire, say number 17, about six inches long is run and bent around and wrapped on itself so as to hold securely. The other end of the wire is bent either before or after putting in the stake into a hook to hold the cloth. The hook should extend about three inches clear of the stake.

These stakes should now be driven into the ground for about half their length, placing them three feet apart in rows thirty-four inches apart, as some allowance must be made for the shrinking of the cloth, which is a yard wide. Turn the hooks the way the rows run, and let them all point in the same direction.

They are now ready for the cloth. If the hooks set to the east—and I set mine that way as our hardest winds come from the west—begin at the western end of the row. Run the hooks through the selvage of the cloth on each side and lock the outside row of hooks as you go, by twisting the wire around on itself. Leave the inside row of hooks open till you bring up the other width of cloth. Then when the selvage of that is caught on them lock those hooks, leaving what is then the inside row unlocked to hold the cloth on the next trip up. Always go back to the same end to start. When the bed is covered lock the outside row of hooks also.

Your bed is now covered solid with the cloth except for the small gaps along the rows of stakes, and if they are placed in straight rows and driven perpendicular, the gaps will be too small to do any harm. As the cloth is stretched only four inches from the ground and is quite elastic, snow presses it down without tearing it. When the danger from snow is past and the plants about ready to bloom, the covering can by a few minutes' work be raised to quite eight inches from the ground, in this wise: Begin at the end opposite to that on which you began to attach the cloth and bend the soft wire hooks straight upward over the stakes and leave them there. The cloth is so elastic that it can be walked on without injury except very near to a stake.

When the berries ripen remove the cloth, fold and tie it up neatly. Well handled it will last three years. The stakes, pulled up and kept where the hooks will not rust too badly, will last five years.

The benefit of this mode of covering is threefold. It protects from any ordinary late frost, even though the plants may be in full bloom. It hastens the growth and ripening of the berries, bringing them to the table a full week, and in some seasons ten days, earlier. The vines are thrifter thus sheltered, perhaps, because it is the nature of the Strawberry in the wild state to have the protection of weeds and grass, and they bear finer fruit and more of them.

It seems, too, that the distribution of pollen, especially when pistillate are grown with staminate varieties to pollinize them,

is far better under the cloth. As thin as it is, it offers enough resistance to the air to keep the pollen-laden currents of air in great measure near the ground and among the plants.

The original cost of this protection is from three to four cents a square yard. After that it is the mere trouble of putting on and taking off, till the material has to be replaced by new. No thorough-going gardener, after once using it, will ever relapse into the old haphazard manner.

Kittrell, N. C.

O. W. Blacknall.

Early Peas.

THERE is fortunately no longer any need to waste the space in our home-gardens with the little extra Early Peas so much used by the market-gardeners.

We now have Early Peas of fine quality and productiveness, and dwarf enough in habit to suit the smallest garden. Among these the American Wonder is still unsurpassed in the matter of earliness. Its chief fault is its extremely dwarf character, but this will allow of closer planting and make it desirable for limited grounds. One of the most promising of the new peas is the Chelsea, which we tried last year for the first time. This variety was conspicuous among forty or fifty other sorts for its compact, dwarf habit—about fifteen inches high—and the wonderful profusion of its bearing. The snowy promise of its blossoms, which made the row conspicuous among its fellows, was fully met by the abundant pods. This is the most formidable rival of our old favorite Premium Gem that we have ever yet tried, and it is early with us as Alpha. While here, in North Carolina, these early peas now (January 25th) are being planted a little later than usual, owing to the wet weather. There is still time to consider the question of varieties and modes of culture in more northern gardens.

Peas grow rapidly and complete their growth in a very short time, so give them plenty of readily available food. Even on the richest garden-soil it will pay to give them a send-off with a good dressing of dissolved South Carolina phosphate and sulphate of potash. The mixture should contain eight to ten per cent. of phosphoric acid and six per cent. of potash. A little cotton-seed meal will be of benefit for an early start. The early sowing of Peas should be in a shallow furrow and the soil drawn up in a sharp ridge over the rows, so as to cover them about six inches deep. The ridge lessens the danger of their rotting in too wet soil when sown early, and will warm up earlier than the flat surface. No matter what your latitude, sow the earliest Peas just as soon as you can possibly get the ground in order. They will germinate when only a few degrees above the freezing point, and if not pushed into too rapid a growth by unseasonably warm weather, will stand a hard freeze when once above the ground.

My practice is to sow some of the extra early and early sorts at the first sowing, and then as soon as these begin to appear above the ground sow more of the early sorts, with a selection of late varieties for succession. For earliest planting in the family garden we advise American Wonder, Alpha, Chelsea and Premium Gem. For the second and later sowings a few Premium Gems, and a good lot of Stratagem, Yorkshire Hero, Horsford's Market Garden and the old reliable Blue Imperial.

Most of these are rather dwarf in habit, but all, except American Wonder, will be better for some support, and in a private garden neatness alone requires that they should be kept off the ground. For support there is nothing better than the galvanized wire netting, which we have before recommended. This can be had of various widths, at about half a cent per square foot. I used large quantities of it last year, and the rolls have been kept stored away ready for many future seasons' use. It is cheaper than cutting brush out of one's own woodland as I have proved, and is the neatest trellis that can be had. It is fastened to stout stakes set 16 feet apart in the row. We use the same material for training Tomato-vines.

Raleigh, N. C.

W. F. Massey.

Lithospermum prostratum.—This lovely little rock-plant has not proved quite hardy here. It has endured a few winters, but never seemed to recover from the cold, getting weaker every season, until finally it died. But our rock-garden is in a very exposed situation, without a warm or sheltered nook in it. It is such a favorite with me, however, that I now grow it as a cool greenhouse-plant. Naturally decumbent in habit if grown in a suspended pot, it will hang over on all sides, completely hiding it. The foliage is small, dark green and abundant. The flowers are a bright metallic blue, a color almost characteristic

of the order Boraginaceæ, to which it belongs, and which includes the common Alkanet, the Virginian Cowslip, the Forget-me-not, and other common border-plants, with bright blue flowers, and many plants once commonly used by the old herbalist.

Wellesley, Mass.

T. D. H.

Correspondence.

In the Shore Towns of Massachusetts.—VI.

To the Editor of GARDEN AND FOREST :

Sir,—Mashpee is in some degree an Indian town—Indian enough to be interesting. Before 1834 there was a reservation here, managed by the commonwealth, and the Indians were oppressed and depressed much as Indians usually have been in this country. But since 1834 the people here have constituted a town, with the same organization and relations to the state which other towns possess. These Indian people are poor, and they appear to have more public spirit than the average white people of this country. The town officers are Indians, and the town records are admirably kept. One of the principal Indian men here is a native of Boston, and he has seen much of the world as a sailor. He is a man of broad and varied intelligence and of very substantial intellectual character. He was a Representative in the Massachusetts Legislature some years ago. He resembles in an astonishing degree, in looks, manner and speech, some of the principal chiefs of the Sioux Indians of Dakota with whom I am acquainted. The Indian Town Clerk here is a valuable man in his office. I tried to persuade these Indian people to select a boy having sturdy health, prepare him well and send him to Harvard, and I hope they will yet do this. Mashpee has no holdings for places of public resort. The village is "beautiful for situation" on the shore of Great Pond, a lovely piece of water, with shores wooded nearly all around. A hill on the shore at Mashpee village has a fine grove of Pines, and a dozen acres here would make a beautiful and valuable reserve, but the people are too poor to buy the land, though it would not cost much now. The summer visitors need it already, and will need it more and more. They are only beginning to discover this beautiful region.

The view from the head of the lake, on the road from Sandwich to Mashpee, is of great beauty and interest. Mr. Benjamin Boardley, a colored man who lives here, is a manufacturer of philosophical instruments, and he is also building a steamboat to run on the lake for excursions for the summer business. The three pretty islands in this lake are owned by a company of friends—Mr. Cleveland, Mr. Gilder, the editor of *The Century Magazine*, the two Jeffersons, father and son, and another gentleman. The hotel at Mashpee is one of the best in any shore town.

Falmouth has no public holding except a town-landing, which is not much regarded. I called on Mr. Joseph Fay, who has had much experience in tree-planting. The people in all that country say that he has not only planted thousands of trees himself, but has influenced other men to plant many more. He formerly planted Scotch Pines, but afterward concluded that they are inferior to our native trees for planting in this country. He thinks trees can be made to grow almost anywhere, and that any sea-shore waste in this state can be reclaimed by the methodical planting and care of suitable trees. Mr. Fay has a beautiful Pine-grove of about fifty acres, which he bought many years ago to preserve it. It is an old picnic-ground and much-used public resort. He thinks of offering it to the town or to the Trustees of Public Reservations. Mr. Fay thinks it wrong for towns to yield their public holdings to the attacks of private greed, and regrets the lack of spirit to contend for public rights, as it is this spirit which has built up the structure of protecting laws and institutions for our civilization.

Wareham has no place of public resort. An area large enough for a pleasant green in front of a church is claimed by two men, and the Court adjudged the right to improve it to the two acting together. But as they do not act together it lies waste and unattractive. There are some beautiful White Oaks in Wareham which in form resemble the Live Oaks of Louisiana and Texas.

Marion has beautiful woods along the shores, all private holdings. Mr. Gilder, of *The Century Magazine*, lives here in summer. A great rock, which has a large White Pine growing up through it in a curious way, was about to be broken up, when Mr. Gilder interposed and paid the price asked for the rock. It is thus preserved for the present, and it is an interesting object. A small area of land around it should also be bought, so as to provide for its permanent preservation.

Mattapoisett has two bathing-places on the bay-shore, each perhaps one hundred feet square, four bath-houses and a pavilion. Some years ago the town obtained a special act of the Legislature, authorizing the formation of a park to include the entire water-front of the village—all the land between the main street and the water's edge. The ground was very cheap then, but the plan was opposed by two or three persons and finally abandoned. Now the land has all been taken up by the summer people, and its purchase by the town would be impossible. There is no park or common.

Fairhaven tried about twelve years ago to buy a square for a common, but the project was opposed and relinquished, and there is nothing of the kind in the town except Fort Phoenix, an area of about four acres, to which the national Government holds title. Mr. C. J. Tripp, the custodian of this property, is also chairman of the Committee on Property of the vigorous Town Improvement Association here. He has had charge of the fort about five years, and the trust could not be in better hands. The view from the parapet is of great interest, and from 1,000 to 2,000 people enjoy it daily in warm weather. The association wishes to buy the guns and keep them in place on the walls, but a man on the Hudson wants them for his door-yard. There are five of them, rifled 24-pounders, made at West Point for the Mexican war. The association hopes to acquire title to a bathing-ground on the beach. This society was started to set out trees, but Mr. Henry H. Rogers now buys all the trees needed by the town, and the selectmen plant them. Mr. Rogers is building an extensive library and town hall for the town. There is a cannon at the centre of the village which was captured from the British in the war of the Revolution. An inscription on a bronze plate on the gun recites the main facts in its history. An old Indian burying-ground at Scoticut Neck is now covered by a grove of trees. John Cook, the last survivor of the Pilgrims, is buried in Fairhaven, and the Improvement Association will care for his grave and erect a monument.

New Bedford has a population of 45,000, and a common of seven and three-fourths acres. A drive-way eighty feet wide leads around Clark's Point. The long, winding and very narrow bridge over the Acushnet River, between New Bedford and Fairhaven, is painfully crowded on summer evenings. It offers hardly more than space for the wheel-way. People on foot can barely avoid obstructing the drive, and are in constant danger of being run over by carriages. The dust is suffocating, but the bridge crosses the wide water, and along its course the crowds meet the delicious breath of the sea. It is the only path of escape from the heated city on summer nights, and it should be broadened so as to be a clean and comfortable promenade for the thousands of men, women and children who would seek coolness and refreshment here if there were room for them. It would promote the health, happiness, morality and civilization of the city.

Dartmouth has no public holdings for places of resort, but there are two or three landings at the end of streets or roads. Westport has town-landings on both sides of the river at the head of Westport; their area perhaps four or five acres in all. Part of it is leased to citizens for building purposes. About two acres of land on Horseneck Beach are owned by the town, including a highway, landing and watering-place. There are no commons or parks.

Fall River has two parks—North Park, of fifteen to twenty acres; South Park, sixty acres. There is a public bathing-place, but it is not in good condition, although it might be made so by a breakwater. Leading men here and in New Bedford say that the operatives in the factories appear not to value or use the parks so much as they should. They seem to need some kind of out-of-door amusement or means of entertainment to attract them to the parks. They stay indoors too much, and go to miserable shows in hot, close halls and theatres when they should be in the open air. Is this a new problem, or an old one? It would require time and considerable special observation to ascertain whether the working people of Fall River are less inclined than those of other cities to use and enjoy the public parks. No doubt, the journalists of the city could give us interesting and valuable information on these subjects, and their discussion of them would receive general attention.

I believe there are forty-six of the shore towns and cities of the state named in these notes. Only Newburyport, Manchester, Salem, Lynn, Quincy, Weymouth, Plymouth and Fall River can be regarded as fairly well equipped with parks and commons. Perhaps Essex should be added to this list. Rowley, Marblehead, Hingham, Cohasset and perhaps a few other towns have small commons, but most of the shore towns have no park, common or open space of any kind to which the

people have a right to resort. New Bedford, with 45,000 people, has seven and three-fourths acres of common, nothing besides, and Gloucester, with 25,000 people, has no public area of any kind.

Franklin Falls, N. H.

J. B. Harrison.

Forests and the Flow of Streams—an Eighteenth Century Opinion.

To the Editor of GARDEN AND FOREST :

Sir,—Much has been written of the influence of forests and their destruction upon the flow of rivers, but in all the literature of the subject there is, perhaps, nothing more curious than the following passage from the *History of the Three Provinces, South Carolina, Georgia and East Florida*, by William Gerard de Braham, Esq., His Majesty's Surveyor-General for the Southern District of North America, reprinted, so far as relates to Georgia, in 1849, by Mr. George Wymberly Jones, from the manuscript preserved in the Library of Harvard College. The author's investigation of the natural features of the Province of Georgia and the adjacent regions extended from 1751 to 1771. The first settlement of Georgia had been made by Governor Oglethorpe in 1732, and Braham tells us that "the Introduction of Sawing, Stamp and grinding Mills was almost as Early as the Settling of the Province; for which Purpose several Streams, Rivers and Rivulets proved very Convenient, but some Rivulets have disappeared two or three years after being chosen, and left the Mills dry, for the following reasons: The Rivulets, as well, as all Rivers and Streams are both sides bordered with large Forests, either low Swamp or high Oak Land, of which the Undertakers of Mills cleared only a small spot of the Trees for the Mill, above which they carried across the Rivulet a Dam, by which the Rivulet overflowed its Shores, and spread its water all over the adjacent lowest Land of the Forrest; the Trees of which (: being Air Plants :) became Subject to the Destruction proceeding from stagnant Water. In short all the Trees perished, their old Roots shrunk from their Barks, and the young Roots with their Barks shrunk from the Earth, so that either between Bark and Root or between Bark and Earth Openings appeared, and the Ground thus perforated became like unto a Sieve, through which the Waters of the Rivulets sunk down to the Quick Sand, where they will continue sinking, until these Passages in course of time are stopt up. This Evil might have been prevented, had they laid out the Land intended to reserve the Mill water into a Field, and planted it for two or three years, and during this time grubbed up all Roots, for which Labour the Crops would have richly rewarded, them (: when the Field overrun with Grass :) had run the Dam across the Rivulet, so they would have kept their Mill water on their old Fields without danger of ever losing it."

Brunswick, Ga.

F. S.

Meetings of Societies.

The Western New York Horticultural Society.—II.

WE herewith continue the report of this meeting, which was begun last week. The first paper quoted was by Mr. Wm. McMillan, Superintendent of Parks in the city of Buffalo, and it was entitled

OUR AUTUMN FOLIAGE.

It is a well-known fact that the autumn colors of the foliage of American fields and forests are much more brilliant than the tints assumed by the ripening foliage of the woods and waysides of Europe. This notable difference is usually attributed solely to the difference in climate, and more especially to the relatively larger amount of sunshine in America. This explanation may seem reasonable if the comparison be made with the north-westerly half of Europe, where the autumn weather is much cooler and cloudier than here. But the skies of southern Europe are said to be as clear as our own. Near the Mediterranean the autumn days are milder and brighter than in any of our northern and eastern states. Yet the far-famed sunny sky of Spain, of Italy, or of Greece does not color the ripening foliage either on trees or underbrush so strongly or so generally as the American sun does, whether the season here be clear or cloudy. Difference of climate, therefore, cannot be the sole reason, perhaps not the chief one.

There is a common belief that frost is a principal agent in producing the most striking tints, and hence we often hear the remark made that the most highly colored leaves are tinged by frost. This must seem a strange delusion to any one who

watches closely the development of the different shades on the earliest species that ripen long before the first touch of frost. In fact, it may be noted that, as a rule, the brightest tints, whether of red or yellow, and the most extensive display of either, appear during the first half of the season; and the trees and shrubs which turn later show their best hues when the advent of frost is longest delayed. When frost finally comes all foliage susceptible to its touch shows that its action is always to tarnish and never to varnish. Yet it is so easy and natural to reason that autumn leaves are bright-colored because they are frost-bitten, that it is quite probable this will always remain the common belief.

If, then, the influence of frost is always to blur rather than to brighten the foliage, and if also, as is generally conceded, our northern states are subject to the first killing frost at an earlier date than in Europe, the more gorgeous coloring of our autumn woods must seem strangely anomalous if it occur in spite of these disadvantages. I can account for this apparent anomaly only by assuming that it is due to the inherent quality of the plants rather than to the outward action of the elements; in other words, that it is due to the difference in the species most prevalent in each country rather than to difference in climate. Of the species most showy or abundant here, none are indigenous in Europe. Conversely, this explanation is confirmed by observing that most, if not all, of the European trees and shrubs cultivated here show even a less body of color than in their native country. As a general rule, European trees and shrubs grown here retain their foliage much later than American plants of related genera. Consequently, our first frosts come on foliage still partially green, and the effect is to stain or wither rather than to color.

If, then, the high color of our autumn foliage is due to the difference in the species of our trees and shrubs, it may be interesting to note some of the kinds that are brightest or most abundant. It will be seen that the number of species is comparatively few, and that the gorgeous appearance of our forests and fields in autumn is owing rather to the general or extensive distribution of these few kinds. The earliest tree to herald the approach of autumn is the Red Maple. It is closely followed by the Virginia Creeper, the Sour Gum, and the several species of Sumach. All of these assume intense shades of red, and their great abundance makes them everywhere conspicuous. Later, the various shades of yellow appear on the Sugar Maple, the Swamp Ashes, the Small-nut Hickories, Butternut, Tulip-tree, Poplar, Birch, Larch, Spice Bush, Witch-hazel and Yellow Root.

If the season be favorable a considerable body of darker or duller shades of yellow is furnished by the Elm, Beech, Walnut, Chestnut, Basswood, Mountain Ash and Grape-vine. Meanwhile, as the earlier species with reddish leaves drop their foliage, the various shades of red and reddish purple are continued by the Red and the Scarlet Oaks, Sweet Gum, Hornbeam, Shadbush, Hazel, and the several species of Dogwood, Viburnum, Whortleberry and Blackberry. This list is not large, but each species is very widely represented in all our northern woods and by-ways. There are a few other species not so widely distributed that may show on close inspection remarkably bright tints and variegations, such as the Buckeye, Sassafras and Honey Locust, but at a distance these contribute very little to the general display.

We are wont to speak of autumn leaves as being golden, orange, scarlet, crimson, purple, etc., but these terms are rarely accurate on close inspection. When illuminated by sunshine and seen at a favorable distance and angle with the sunbeam, these terms may be appropriate. But on critical examination at close quarters the leaves that showed so clear and pure a tint as the light shone through them or glanced from them, reveal usually a more or less stained mixture of impure shades. In purity or delicacy of tint they will not bear comparison with flowers, nor even with the fresh hues of the opening leaves on some species in the spring.

It must be remembered that the whole display is but a fleeting show—a kind of dissolving view. The duration of the brightest tints is very brief, and to be seen to the best advantage they must be sought and found at exactly the right nick of time. On the most tempting plants a long hunt through the branches may be required before a single leaf is found that is pure or uniform in color, or perfect in form and texture. The outer foliage is usually too much browned or torn by sun and wind, and so the clearest colors and best preserved specimens are more common toward the interior of the tree or bush. This is more noticeable in foliage of any yellow shade than of either red or purple. To develop the latter hues more sunlight is necessary. It is sometimes curious to observe the sharp contrast on the same leaf, when one part of it has been fully

colored in the sunlight, while the other portion, hidden under an overlapping leaf, is still quite green.

Usually each species of tree or shrub assumes the same tints each autumn, varying in degree only according as the season is favorable or not. But some species sport considerably, sometimes being arrayed in orange or parti-colored livery, instead of yellow, or red or purple. The Sugar Maple, the Sassafras, the Buckeye and the Sweet Gum are examples in point, and also the Red Maple, the Shadbush, the Poison Ivy and the Poison Dogwood. Of all our native shrubs this last is surely the most gorgeously arrayed in autumn. The most noxious plant in all our woods may thus be charged with "stealing the livery of Heaven to serve the devil in."

When the Sugar Maple shows a strongly reddish tinge it is a pretty sure indication of starvation or disease. It often happens that some branch is affected while the others are healthy, and thus it will become prematurely and strongly colored while the others are yet green. The leaf of the Sugar Maple is often remarkably veined and variegated, the striping and mottling being sometimes so bold and strong as to resemble the figures on the wings of butterflies. On the same tree or branch leaves of this kind may be found along with others having all shades of yellow or orange or russet.

The White Ash ripens through a curious range of colors unlike any other tree. The green leaf darkens to chocolate and purple, and then turning to violet gradually lightens to brown and yellow. Several of the Oaks have also rare shades of red, russet and tan. As the tissue of all Oak-leaves is too thick to let much sunlight pass through, these colors seem at a distance duller than they appear at short range. Semi-transparent leaves show off to the best advantage in autumn, as the sun-beam makes crimson leaves seem scarlet, russet leaves golden, and lightens every hue in like manner.

Our ornamental plantations make little impression on the general landscape. Of the many trees and shrubs in ordinary cultivation a large proportion are of European origin, and very few are notable for the color of their autumn foliage. As already stated, most of them are harmed by frost in this latitude before the foliage has had time to ripen fully. The Norway Maple is perhaps the most notable exception to the rule. When the season is favorable it fairly rivals its near relative, the Sugar Maple. The Horse-chestnut turns yellow in a favorable season or situation, but its foliage is often prematurely seared by heat or drought or browned by fungi. One other European plant, the Smoke-bush, assumes a strong ruddy tint, showing thus its blood relationship to our Sumachs, a family of plants all notable for the crimson hues of their dying foliage, and also for the various dyes and varnishes and tannic acids obtained by draining their veins after death.

We have in cultivation many trees and shrubs from China and Japan, all of which likewise retain their foliage later than the related species indigenous here. Consequently few of them have the opportunity in this latitude to show the bright colors they occasionally display further south. But the Plum-leaved Spiræa, and the creeper called usually Japanese Ivy, show brilliant shades of red if the season be favorable. The rich variegation and strong contrast of colors exhibited by this so-called Ivy are very striking, because the foliage shows simultaneously every stage of the ripening process from the growing twig to the dropping leaves. Its cousin, the Virginia Creeper, sheds all its foliage a month sooner, its crimson tinge being remarkably strong and uniform over the whole plant. Two foreign coniferous trees, the Larch and the Maiden-hair, that, unlike the Pines, shed their leaves in autumn, change to a bright yellow, and are very conspicuous in a favorable season. Another tree of this family, the Bald Cypress of the southern states, is equally notable for its ruddy tinge.

But the fresh verdure which many foreign plants exhibit, for weeks later than species of the same genera indigenous here, is some compensation for the lack of high color on their immature leaves. This lively and lasting green affords a fine contrast to the autumn coloring of all our native foliage already dying or dead. Some of these plants have a sub-evergreen character, and are but slightly tarnished by frost until perhaps the middle of December, as may be noticed on all the Japanese Privets and Honeysuckles. When finally all the deciduous trees have shed their leaves, the foliage of the evergreen Spruces, Pines and Cedars becomes conspicuous, but generally its aspect is too sombre to be specially attractive, until it becomes heightened by contrast with the snows of winter.

In conclusion, some notice should, perhaps, be taken of the herbaceous foliage of our fields and by-ways in autumn. Strong shades of yellow are common, and some others are reddish purple, most notably the Poke-weed, the strong crimson dyes of which must be familiar to all of you. In our eastern and

northern swamps the Cranberry-vines are often remarkably ruddy, and in the sea-side marshes the Samphire may be seen in autumn in large patches, that attract the eye a long way off by the intense crimson of the leafless stems, which are brighter in color than any foliage of either forest or field.

HOW TO OBTAIN MORE HIGH-GRADE FRUIT.

This subject was treated by Mr. George T. Powell in a practical address, from which we make the following extracts: "We cannot plant young orchards in land from which we have taken continued crops of grain and grass for years, and while the trees are growing continue to take off potatoes, oats and grass for fifteen or twenty years longer, and then hope to secure full crops of good fruit. The trees must be well planted in the first place, with roots pruned back to half their length and the top cut in quite as severely. The branches of a nursery tree are not where they are needed; often two of them are nearly opposite, which will make the tree liable to split apart. Therefore, it is good practice to take off the top entirely, leaving only buds on the main trunk where the future branches are desired. When trees are thus prepared for planting pruning for the next ten years can be done with a pocket-knife, and the fruit and foliage will be where they are needed. Since the foliage plays so important a part in preparing plant-food for use a good growth of leaves should always be ensured. It is of little consequence to use poisons against insects that devour fruit, and fungus diseases which destroy fruit, when the leaves are left to be infested with insects and parasites. Since I have sprayed the foliage of my orchards good Spitzenburgs can be grown once more. Before they were treated in this way these trees set full of fruit, but they never matured into large handsome apples. Healthy wood and healthy foliage are essential to vigorous fruit-buds and perfect fruit. There is a demand abroad, which has never been supplied, for fruit of high quality. In the Old World flavor counts for more than appearance. Every barrel of Ben Davis apples we send abroad depreciates the value of the best American apples."

THE TOXICOLOGY OF THE COPPER COMPOUNDS WHEN APPLIED AS FUNGICIDES.

After considering the chemistry of the copper compounds, the form in which they appear on the grapes, and giving a careful review of the opinions of leading chemists and medical authorities here and abroad, Professor Fairchild gave the following conclusions, based upon his examinations of grapes from the Hudson River district, where the largest amounts of copper were used:

1. The danger from the daily absorption of small quantities of copper salts with foods has been greatly exaggerated. The poisonous nature of such doses is not only not proven, but is denied by eminent authorities, whose views are supported by abundant evidence.

2. Grapes sprayed with the Bordeaux mixture according to the directions of the department in their latest publications cannot possibly contain more than 35,000 of a grain of copper to a pound of grapes in the bunch, which amount is less than one-tenth of the amount contained in a pound of ordinary beef-liver, and absolutely inoffensive to the human system.

3. The insoluble form in which the salt of copper occurs upon the clusters, and the fact that the consumers do not eat the skins nor stems, places the mixture further still from suspicion.

4. The use of a reduced formula for the Bordeaux mixture, containing only two pounds of copper sulphate in place of six, and the substitution of the ordinary ammoniacal solution for the latest treatments immediately before ripening, will place the practice beyond the slightest possible suspicion.

Dr. Van Slyke, who analyzed the grapes from the Hudson River district, from which the grapes causing the trouble in the New York market came, gave the results of his analysis, some of which were not worked out in time to incorporate them in Professor Fairchild's paper.

The amount found on the grapes was very constant, varying from $\frac{1}{125}$ to $\frac{1}{120}$ grain per pound of fruit and stems. Physicians give one-fourth grain doses of copper as a tonic and astringent. Three thousand pounds, stems and all, would have to be eaten to get a dangerous amount of copper. The copper does not occur in the form of sulphate on the fruit, but as carbonate, which is not nearly so soluble.

Notes.

According to the *Dolgeville Herald* there were 300,000,000 feet of timber cut last year in the Adirondack forests. Two-thirds of this was made into lumber and the remainder into

paper-pulp, the product of pulp for the year being about 109,200 tons.

Curiously as it seems to us, the Japanese rank the purple form of the Wistaria high above the white form, and white blossoms of this plant are very seldom used in their floral designs.

An enterprising nurseryman in California offers to send free of charge to the children of every public school in the state a package of plants or a collection of Sweet Peas, if the children will pledge themselves to cultivate the plants within the school-grounds.

It is said that the apple-growers of Albemarle County, Virginia, have lately met a serious loss through the failure of a commission house in Liverpool, to which many of the famous pippins of the region had been consigned. This would seem to be another reason for trying to make a market for these apples in our northern cities.

Two of the new double Lilacs raised by the Messrs. Lemoine are figured in the number of the *Gardeners' Magazine* which has just come to hand. One of these has pure white flowers, each like a little rosette, and is named Madame Lemoine; the other, called Leon Simon, has deep purple flowers, which are very double. Both of them received awards by the Royal Horticultural Society last year.

A correspondent of the *American Florist* speaks of the remarkable absence of hybrid Roses from the flower-markets of this city this year as compared with former winters, when these Roses have been forced in large numbers. An occasional handful of Magna Charta Roses is all that can be seen in this line, and the result is that the only large Rose offered is American Beauty, while Meteor is the only crimson Rose for sale in any quantity, and therefore the supply of these kinds falls very far short of the needs of the market, and they are in very brisk demand. Pink is popular this year, and Madame Cusin, once classed among the most undesirable of cheap Roses, is now a leading favorite, and is sometimes ahead of Catharine Mermet in price. The Bride is still the standard white Rose in this market.

Royal rank is attributed in Japan to three flowers—the Pæony, the Cherry and the Lotus. The Pæony must always be given the position of honor in a chamber on the dais of the principal recess, and may never be placed on a shelf or in any central place; and all other flowers must be excluded from the room adorned by its royal presence. A couple of black, withered twigs are sometimes introduced among the leaves and flowers of Pæonies to enhance by contrast the luxuriant appearance of their leaves and flowers. The Lotus-plant is excluded from festive gatherings because associated with the spirits of the dead, but holds high rank in the art of floral arrangement. It is called the king of Indian flowers, and taste would be grossly violated were it ever combined with the Pæony, which is the royal flower of China, as the Cherry-blossom is of Japan.

Some time ago Colonel A. W. Pearson expressed the fear in our columns that the continuous application of copper compounds to plants as fungicides might result in the accumulation of these salts in the soil in sufficient quantity to cause sterility. In some experiments at the Geneva Station, as reported by Professor S. A. Beach in the *Country Gentleman*, the relatively enormous quantity of two per cent. and five per cent., by weight, of copper sulphate were dissolved and mixed with soil, and plants were grown in this soil. More seeds germinated in the soil treated with copper than in the untreated soil, but the plants were dwarfed, although they matured earlier than the check-plants in untreated soil. Analysis of the top-soil from a potato-field which had received many applications of Paris green, showed about three-ten thousandths of one per cent. of metallic copper. The soil from a field to which Bordeaux mixture had been applied for potato-blight, showed four-ten thousandths of one per cent. of metallic copper, or about sixteen-ten thousandths of one per cent. of copper sulphate. To impregnate such a soil as that which was used in the analysis to the depth of one foot with one per cent. of copper sulphate would require more than 32,000 pounds of the sulphate to the acre, and if applied at the rate of thirty pounds to the acre every year nearly 1,100 years would be required for its application, provided none of the salts escaped in drainage.

Mr. S. D. Dill has lately returned from the Pacific coast, whither he went to secure specimens to complete the Jesup collection in the Museum of Natural History. The most inter-

esting specimen he obtained is a portion of the trunk of a *Sequoia gigantea*, which was sixty-two feet in circumference eight feet above the ground, and ninety feet in circumference at the surface. It is estimated that the tree contains 400,000 feet of lumber, and a piece of the trunk four and a half feet long weighs over thirty tons. The giant stood three hundred feet high, and it was one of a few which still remained of a magnificent grove which is being rapidly converted into lumber. Two mills belonging to the company which own the tract cut 130,000 feet daily during the summer season. On another tract owned by this company there stands a forest of these giant trees containing enough timber to keep their mills running at their present capacity for fifty years. A railroad is to be built to this body of timber to convey the logs to the mill. After the trees are cut down and the logs are cut off it is necessary to split them up with dynamite into quarters before the lumbermen can handle them. Mr. Dill also secured a specimen of *Quercus McDonaldi* from the island of Santa Catalina, although it was formerly thought that this tree grew only on the island of Santa Cruz. *Quercus Morehus*, *Pinus latifolia* (the tree discovered by Dr. Mayr in 1887), *Yucca elata*, *Quercus Engelmanni*, *Q. Palmeri*, *Q. agrifolia*, *Q. Jacobi* and *Populus trichocarpa* were among the other species of which Mr. Dill collected specimens.

A correspondent of the *American Architect and Building News*, writing recently with regard to the World's Fair at Chicago, says: "From an architectural point of view the exhibit from Japan promises to be extremely interesting, and it is hoped that nothing will prevent the execution of the plan. Two acres of the space on the northern portion of the much-sought-after Wooded Island are desired for the exhibition. This sylvan spot was not originally intended to contain any building, and it is somewhat amusing to notice that space for such among its sheltering trees has been demanded by the promoters of nearly every exhibiting scheme. If the two acres are provided in a desirable location there will be erected on them a copy of one of the finest specimens of ancient Japanese architecture extant, and this structure, together with several others equally interesting, will be given to the city of Chicago at the close of the fair as a permanent monument of Japanese architecture and landscape-gardening. The building, it is reported, will be erected at a cost of \$100,000, while the landscape-gardening will be at a cost of \$20,000. One of the other buildings which the Mikado proposes to erect is a reproduction of one at Kioto, a monastery of the Zen sect. Its name is said to indicate the golden pavilion, and its date of construction runs back to 1397. It is surrounded by a garden, with ornamental and small islands designed in the form of tortoises. The pavilion at the water's edge is three stories high, and the interior decorations are said to be brilliant with gilt and coloring. Another building which the Japanese Government proposes erecting is a fac-simile of the so-called Ho-o-do, or Phoenix Hall, a structure that dates back to 1052, and is so shaped as to, in a manner, represent the fabulous bird which is not to be destroyed with fire. There is to be a so-called industrial court, where the different workers of Japan will have their place, and at the entrance a copy of the Yomei Gate of Nikke will be erected."

Catalogues Received.

A. BLANC & CO., 314 North Eleventh Street, Philadelphia, Pa.; Hints on Cacti.—EDW. W. CONE, Menomonee, Wis.; Descriptive List of Choice Strawberry-plants.—CURRIE BROS., Milwaukee, Wis.; Horticultural Guide.—J. ROSCOE FULLER & Co., Floral Park, Queens County, N. Y.; Flower, Grass and Vegetable Seeds, Bulbs, Small Fruits, etc.—BENJAMIN HAMMOND, Fishkill-on-the-Hudson, N. Y.; Trade Price-list of Insecticides.—TIMOTHY HOPKINS, Sherwood Hall Nurseries, Menlo Park, Cal.; New and Choice Chrysanthemums, New Carnations, Roses, Ferns, Violets, Palms, Trees and Shrubs.—JOHNSON & STOKES, 217 and 219 Market Street, Philadelphia, Pa.; Vegetable and Flower Seeds, Bulbs, etc.—WILLIAM G. McTEAR, Princeton, N. J.; Price-list of Chrysanthemums.—T. V. MUNSON, Denison, Tex.; Grapevines, Small Fruits, Roses, Shrubs, Shade and Fruit Trees.—L. L. OLDS, Clinton, Wis.; New and Choice Varieties of Seed Potatoes.—PRAIRIE STATE INCUBATOR CO., Homer City, Pa.; Prairie State Incubator and Brooder.—W. W. RAWSON & Co., 34 South Market Street, Boston, Mass.; Vegetable and Flower Seeds, Small Fruits, Shrubs and Trees.—WM. TRICKER, Dongan Hills, Staten Island, N. Y.; New and Rare Water Lilies, Nelumbiums and other Choice Aquatics.—J. C. VAUGHAN, Chicago, Ill.; Flower and Vegetable Seeds and Plants.—THOS. S. WARE, Hale Farm Nurseries, Tottenham, London, England; Illustrated General Catalogue of Flower and Vegetable Seeds, with separate illustrated lists of Chrysanthemums, Dahlias, Begonias and Miscellaneous Bulbs for Spring-planting.—EUGENE WILLETT, North Collins, N. Y.; Wholesale Price-list of Small Fruit Plants.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLE:—Florida Pines. (With figure.)	73
The Yosemite National Park	<i>Charles H. Shinn.</i> 74
Winter Rambles in the Pine-barrens.—II.	<i>E. F. Hill.</i> 74
Notes of a Summer Journey in Europe.—VII.	<i>F. G. Jack.</i> 75
NEW OR LITTLE-KNOWN PLANTS:— <i>Begonia Baumannii.</i> (With figure).	<i>F. N. G.</i> 76
New Orchids.	<i>R. A. Rolfe.</i> 76
FOREIGN CORRESPONDENCE:—Bomareas.	<i>W. Watson.</i> 78
CULTURAL DEPARTMENT:—Five New Bulbous Plants.	<i>W. E. Endicott.</i> 79
Perennial Plants from Seed.	<i>O. O.</i> 79
Late-keeping Apples.	<i>E. P. Powell.</i> 80
Tomatoes.	<i>Professor W. F. Massey.</i> 81
Citrus trifoliata, Shrubs in Muck Holes.	<i>Professor W. F. Massey.</i> 81
CORRESPONDENCE:—The Gypsy Moth and its "Extermination."	<i>S.</i> 81
Aquatics at Farview, Staten Island.	<i>F. N. G.</i> 82
Hardy Broad-leaved Evergreens.	<i>William F. Bassett.</i> 82
RECENT PUBLICATIONS.	83
NOTES.	84
ILLUSTRATIONS:— <i>Begonia Baumannii</i> , Fig. 13.	77
Florida Pines, Fig. 14.	80

Florida Pines.

THE picture which appears on another page of this issue (see p. 80) represents a scene familiar enough now to the inhabitants of central and of some parts of northern Florida, and to the thousands who visit the state every winter and spring. A similar scene now meets the eye on the shores of many Florida streams and lakes, from which the original forests of Pine have been pretty generally stripped. On the left of the picture may be seen a specimen of the Long-leaved Pine, so small and stunted that it has escaped the axe of the lumberman and the hatchet of the turpentine-worker. On the right stands a young and vigorous tree of the Pine of tropical America, which botanists call *Pinus Cubensis*. Between the two Pines rises the slender stem of the Palmetto. The young Pines which appear on the two sides of the picture are seedlings of *Pinus Cubensis*, while the ground is covered with the dwarf Saw-leaved Palm, which clothes, with the aid of its spreading root-stocks, the sandy Florida soil as soon as the forest is cut away.

In this picture appear three of the most interesting trees of the American forest. The Palmetto is the most northern in range of really arborescent Palms, a true type of the vegetation of the tropics, and the plant of all others that most delights the northern eye accustomed only to boreal forms of vegetation. The Long-leaved Pine represents the past, and the Cuban Pine the future, of the Pine-belt forests of our extreme southern coast. It is a lamentable fact that the Long-leaved Pine is disappearing and is being replaced by less valuable species. From a time probably long anterior to the arrival of Europeans on this continent the southern Pine-forests have been wasted and abused. First, the Indians burned over the ground on which they grew, to clear away the undergrowth and increase their chances of killing the deer and turkeys which once abounded there. Then the whites, having learned the practice from the Indian, kept up the annual burning

to improve the scanty spring pasturage for their half-starved animals, with the result that these forests, even when the lumberman has not invaded them, stand on ground which is unprotected by undergrowth and from which all the surface humus had been burned away. It is not surprising, therefore, that the trees are far apart and that very few young ones have grown up. These annual burnings have increased in destructiveness year by year for more than a century; and therefore when the lumbermen went into these forests in dead earnest, and began to send the timber they cut from them to the four quarters of the globe, they had a forest to deal with which had lost its recuperative power. When the mature trees were cut away there was no succeeding crop to replace them, and the ground, through repeated burning, had lost the particular quality needed to produce this Pine, and other and far less valuable species replaced it.

More destructive than the squatter's spring fires or the lumberman's axe has been the turpentine-gatherer. For many years the forests of the Cape Fear supplied his demand, but these forests were in time exhausted. Then he began to move south, at first slowly, and then more and more rapidly as overproduction reduced the value of his product and made all but his first year's crop unprofitable. No other commercial enterprise of the civilized world has been so recklessly managed or has produced such meagre profits in proportion to the destruction of the property involved. The cutting into the tree in order to stimulate the flow of its resinous sap, especially if the process is continued through several years, is a serious injury to it; but the injury to the vitality of the tree and to the quality of its timber is a small matter in comparison to the danger of fire, which follows the exposure of resinous surfaces on the trunks of the trees. Three-quarters of all the forests in this country that have been worked for turpentine have afterward been burned to the ground. It seems almost incomprehensible that such wasteful methods can prevail, and yet there are cases on record of a school board in one of the southern states having sold, for twenty-five cents an acre, the right to manufacture turpentine indefinitely on land which they held in trust for educational purposes, and which was carrying five or six thousand feet to the acre of the best pine-timber in the world. The slightest forethought or intelligence, however, would have shown these men that tapping the trees would ruin them. Where such ignorance and indifference prevail, it is not surprising that the forests disappear and agriculture languishes. All these hostile agencies, the axe, the turpentine-tapper, and then the final catastrophe of fire, have worked to the extermination of these forests, which once formed the chief wealth of the southern states, and which as a compact body of available timber of the first quality had no equal in the world.

A part of the territory occupied by this forest, a belt eighty or a hundred miles in width, which extends with a few unimportant breaks from southern Virginia to eastern Texas, will in time degenerate into a wind-swept desert of shifting sand-dunes, which will in time, unless fires can be stopped, gradually spread over the whole territory. In other parts of the region other species of Pines spring up. At the north, that is in Virginia and the Carolinas, the Loblolly or Old Field Pine, of no great worth as a timber tree, is of immense value in the capacity of its seed to generate in burned or sterile soil, and of the young plants to grow rapidly and cover the ground and thus prepare it in time for a more valuable crop. Further south, and especially in middle Florida and in southern Alabama, the Long-leaved Pine is replaced by a more valuable species than the Old Field Pine—the *Pinus Cubensis*, which appears in our illustration. This is the most tropical of the American Pines, and is most at home on the mountains of Honduras and Guatemala, where it forms great forests. It occurs in several of the West India Islands, on the Bahama Keys and on the mainland as far north as the South Carolina coast. Once it was less common in the territory of the United States than it is to-day, for now it is spreading

rapidly and seems destined, in the rotation of forest-crops, to play a not unimportant part in the future of Florida forests. It is one of the most beautiful and symmetrical of all the Pitch Pines, and very showy in midwinter when the great catkins of male flowers hang from the branches. And what is of much more importance, the wood which it produces in Florida is heavy, hard and very strong, and, except in its thicker sap wood and coarser grain, not very inferior to that of the Long-leaved Pine itself, so that if there is anything of promise or of hope in the condition or in the future of our Southern forests, it is that in some favored parts of the country a tree of real value, although inferior to the one it replaces, will probably spread and establish itself until the time when fire shall have destroyed in the soil the elements it requires.

The Yosemite National Park.

IT has become certain that the friends of the great Sierra forest-reservation must unite for its defense against ignorant and short-sighted local combinations. The first struggle, now practically ended, was with the misguided and unhappy Kawean colonists. The impending struggle is partly with the sheep and cattle men who have been stealing pasturage from the national domain, partly with mining speculators, who see possible claims on every barren ledge, partly with lumbermen, who are trying to secure tracts of forest for future use. There are few actual settlers in the high Sierras—there will never be many. The districts that an intelligent public policy would withdraw from sale are almost entirely unfit for farming, and guiltless of the precious metals.

As it always happens in these cases of private greed assaulting public property, the first move is to stir up sympathy for some one or some class. The agitators who have taken the contract to produce such a clamor that the Yosemite Park should be shorn of many thousand acres are anxious to keep in the background. But here and there along the Sierra foothills and in the San Joaquin Valley, we begin to hear of the "hardships of settlers" who "need all the timber." Some of the local newspapers have taken up the cry, and pretty soon it will be in politics.

Mr. Allen Kelly, of the State Forestry Board, who spent last summer in the National Park with the troops, has lately published a very graphic paper upon the subject. His views deserve wide dissemination, to serve as the antidote to falsehoods that enemies of the park are printing. This, for instance, sums up a few of the results:

"Three years ago when Tom Agnew" (an old mountaineer) "came down out of the mountains he counted ninety-two forest-fires on the water-shed of the San Joaquin between his place and Jackass Meadows. The sheep had gone out just ahead of him. Last year there were no sheep in that part of the country, and there was not a single fire.

"In former years it would have been difficult for a company of eleven men with saddle-horses and a pack-train to go through the country on the route that we took, for the reason that they could have found no food for their animals and would have been compelled to pack grain. Last year the grass was plentiful on all the meadows, and camp could be made almost anywhere. Men who live in the mountains say they never before saw so much vegetation late in the season, and the feeling of satisfaction with the results of the exclusion of stock from the reservation is general and deep. The miners of the North Fork and owners of preemption and homestead claims within the park have not found it necessary to stand guard with Winchester over their grass-land, and they have found it possible to go away for a day or two without worrying over the probability that they would find all the feed destroyed by some wandering band of sheep when they returned."

Articles of Mr. Kelly's during the past year in the San Francisco *Examiner* and elsewhere have been characterized by high literary quality and rare capacity of grasping the whole subject. It is a long time since so careful a writer has spent so much time in the field studying such problems. Last summer's work, according to this capable reporter, consisted of one long campaign against the sheep. Captain Wood, an old Arizona Indian-fighter, and Lieutenant Davis, an Oregonian and West Pointer, were the men for the region; they adopted the plan of marching every sheep-herder to the corners of the park, and leaving the sheep to scatter where they chose. This system proved effective, and no other would have done so, for the sheep-men, who were at first treated leniently, kept

driving their flocks back again. Wherever the troops went they saw the results of overpasturing the mountains.

"After entering the country that has been grazing-ground for sheep," Mr. Kelly says, "no game of any kind was to be seen. Deer cannot live where sheep run, because the sheep destroy all the browse; and, moreover, no animal will graze where sheep have fouled the ground. The sheep are driven into the mountains at the time of year when grouse and quail are nesting, and the eggs and chicks of birds that nest near the ground are destroyed by the pattering hoofs of the woolly horde. The high-mountain region is the natural home of the grouse, but in a march of 130 miles only five of the birds were seen.

"It is the testimony of all the mountaineers that before the sheep came into that country game of all kinds was plentiful. Deer were so numerous that a man did not need to leave his cabin-door to get a shot, and grouse could be found anywhere. Hunters have not been numerous enough to kill off the game, and there is no doubt that it has been driven out and destroyed by the sheep."

The evidence that sheep eat off every Fir-shoot within reach, and the young Fir-seedlings, is overwhelming. The ground where they pasture becomes bare and dusty, the young trees die; even the smaller native flora is threatened, and many species are almost extinct. Then come the fires, mostly kindled by herders to burn the underbrush. These fires have done much more damage to the forests than a casual observer would suppose, for the Firs, that constitute a larger part of the older growth, are very easily top-killed. In a few more years they decay and fall. The Fir forests, over thousands of acres of Sierra uplands, are as completely doomed as a North Carolina turpentine-grove after being thoroughly boxed for two or three successive seasons. Other Firs will grow if the sheep are kept out, but the value of the lumber destroyed would buy up every flock in the state of California.

The evidence given by last summer's faithful guardianship of the park contrasts curiously with the heedless clamor of those who regard the system as "an infringement of personal right." The real mountaineers welcomed the troops. When the sheep were driven out game increased, and there was grass for pack-mule, saddle-horse and milch-cow. The real prospectors, wandering lonely and silent through the deep ravines looking for outcroppings, agreed with the rest of the actual mountain-abiders, that the park was a good thing to have. The men of the high Sierra wanted the glory of the forests restored, as they remembered that glory forty years ago. Resolutions against the park came from those who found their free use of national territory at an end, and from discontented and speculative outsiders, mere refugees in the cave of Adullam.

It ought to be easy for the American people to decide the question. Mr. Kelly sums up his report with the remark that "All the timber land in the Sierras now remaining in the hands of the Government should be withdrawn from entry and sale and included in a reservation extending from Shasta to San Bernardino, and the grazing of stock on the reservation should be prohibited and prevented by a patrol of cavalry." This is terse and practicable. It ought to be done by the present Congress.

Niles, Cal.

Charles H. Shinn.

Winter Rambles in the Pine-barrens.—II.

ONE of the most interesting shrubs of the Pine-barrens is *Shepherdia Canadensis*. The stems are from two to five feet high and clustered like those of the Currant, which it also resembles when covered by red berries in the summer. The compound hairs, formed of many spreading rays united by their edges, coat the buds and smaller branches with rusty scales. They have a roundish outline, with an irregular margin, as some of the rays are free at the end and project beyond the general border. Though the color and abundance of the scales, as a whole, give the bushes a rusty look, parts of them are bright, particularly the buds, which glisten in the sun-light with a metallic lustre. The branches may be gray, or gray interspersed with copper-colored spots, the variations being chiefly due to the color of the bark and the structure and arrangement of the scales; for the rays of the compound hairs are primarily white or pale, and colored only as far as they cohere. When but slightly united at the centre, or when deeply fringed, the grayish brown color prevails, but when nearly or completely united, and the scales compactly placed, we have the bright, metallic lustre. The bark itself is of a dark, reddish brown, and when free from scabs, or visible among those less closely placed, adds to the variety of color.

The winter buds of *Shepherdia* make one of its most attractive features. The plant is dioecious, but it is easy to distinguish the two kinds of flower-buds and the leaf-buds from each other. The leaf-buds are the largest of the three kinds, oblong and terminal or in pairs on the slender branches. The abundant buds of the sterile flowers of pin-head size are globular and clustered. Those of the fertile flower are still smaller, slightly pear-shaped, single or in pairs, and not so crowded as the other. An undeveloped branch often shows the oblong terminal bud with a spherical flower-bud on each side at its base, producing an odd appearance. Their covering and structure are instructive as revealing their adaptation to their winter exposure and early flowering in the spring, for they are well on their way of development. Outwardly they are dry and hard. The rusty scales are so crowded that they overlap or interlock by their jagged edges, making a firm outer case. Being irregular in arrangement, the buds are completely shingled, and their vital parts effectually guarded against cold and rain. There are no bud-scales, the first two leaves to be formed and the calyx of the flower, respectively, serving this purpose in the economy of the plant. The leaves of *Shepherdia* being opposite, two of those just starting unite by their valvate edges, and form a case for the more tender part of the bud within. The cavity is copiously lined with soft white hairs like those on the upper side of the mature leaves. Being close pressed, they further protect the tender part at the base of the cavity with a cottony covering. The flower-buds are made of the four valvate sepals, but are not fleece-lined, the wall of the cavity being green and naked. The bud of the sterile flowers is a hollow sphere, in which a lens shows a circle of stamens, with their yellow anthers already well advanced. In the cavity of the fertile bud the ovary and style, its stigma turned to one side, as in the expanded flower, are easily discerned. Even the single ovule can be removed from the ovary. In both kinds of buds the disk which characterizes the flowers is plainly seen. By comparing the internal structure of the buds with their external appearance the eye soon learns to distinguish the two kinds of bush as readily as when they are covered with flowers or fruit.

Some of the Willows are as easily identified in their leafless state as in the summer. The polished bark of the vigorous shoots makes bright pictures in the winter landscape. Many shades of color, varying from yellows to browns and reds, fairly glitter in bright contrast with almost blackened bark of the old stems. The buds on the young canes are likewise showy with their smooth and shining scales. Though the principal home of the Willow is in the water along the edges of the sloughs, where it contends for the mastery with the Alder and Button-ball, the Pine-barrens have several which are essentially dry-ground shrubs, or flourish on the sand-hills. Among these are *Salix humilis* and the less common *S. tristis*. Both are easily distinguished from other kinds by greenish pubescent branches and their smaller size. On the sand ridges and dunes by the lake-shore the prevailing species are *S. glaucophylla* and *S. adenophylla*. They are from two to six feet high, *S. adenophylla* being the stouter in habit. Both propagate freely by means of their roots and buried stems, the stems quickly taking root and sending up fresh stems, so that the species form extensive clumps crowning the low sand-hillocks. They have a light gray bark, but differ in the color of the young shoots and twigs, those of *S. glaucophylla* being smooth and yellowish, while those of *S. adenophylla* are dark red or purplish. The latter also has the buds and tips of the branches densely pubescent with soft gray appressed hairs, and may be distinguished from all others by this character alone.

The region is rich in species of *Cornus*, all but two of the ten found in the northern states growing here. Three of them are conspicuous for their red or purple bark, and *Cornus alternifolia* is quite as distinct for its deep green stems. The brightest of them is the Red Osier (*C. stolonifera*), its bark being of a beautiful red-purple, so that a clump of it well supplied with young canes is almost crimson at this season. The silky Cornel (*C. sericea*), in the same localities, wears a more sober hue of dull purple. More like the Red Osier is the one recently described as *C. Baileyi*, and figured in *GARDEN AND FOREST*, vol. iii., p. 464. Many of the canes are very bright, and the bark polished, as on the Red Osier. But they are mostly darker colored, being dark red to dull purple, in the latter case more like the Silky Cornel. They differ in color much as does the blood in the arteries and veins. *C. Baileyi* is abundant on the sand-ridge which skirts the shore of Lake Michigan and on the high sand-hills contiguous to it. With the two Willows, *Salix glaucophylla* and *S. adenophylla*, it is the most characteristic shrub of the immediate shore. The three have essentially the same habits of growth, and are well

adapted to the same conditions of soil and moisture. All serve admirably to keep the shifting sands in place, and when met with on the dunes and ridges are likely to crown excrescent knolls and hillocks to whose formation they have mainly contributed by retaining the sand heaped about their roots and stems. As the sand accumulates around their lower parts adventitious roots grow out, and the base of each buried stem or branch becomes the root-system of another stem or multiplicity of stems. In this way they spread with rapidity, and form clumps several feet or yards in diameter. *C. Baileyi* propagates readily in this manner. Its stems are ascending or erect, and from two to six feet high. It does not seem to have proper stolons, like its near ally, *C. stolonifera*, but the analogous provision of spreading by layers, which it also shares with the Red Osier in the sands, serves the same purpose. It would appear to be a desirable shrub to plant in the loose sand by a windy shore to keep it in place, for it serves the same purpose, with the Willows already mentioned, and to some extent the Red Osier, as do grasses like *Calamagrostis arenaria*, and others with long fibrous roots. It thrives in the bleakest situations, and is ornamental at all seasons. With the neat and attractive foliage characteristic of all the Dogwoods, it combines the habit of blooming continuously from June until the frost arrests it, with small cymes of white flowers and clusters of white globular fruit charmingly interspersed among the leaves. It is not difficult to pluck from it a branch small enough for a vase bouquet, with buds, flowers, green and ripe fruit altogether, an unusual character in woody plants in our latitude. In the winter the purple, and frequently shining, stems make it equally ornamental. To what extent it may be distinct from *C. stolonifera* is to me a problem still unsolved, for I have found forms of the latter shrub with leaves and fruit undistinguishable from the type, blooming likewise from June to September, and not merely a second time in late summer or in the fall, a habit with which I have been familiar from boyhood. This may, however, be due to local conditions, the soil in which it grows and the proximity to the lake, but it takes away one character on which I had relied for distinguishing the two species.

Englewood, Chicago, Ill.

E. J. Hill.

Notes of a Summer Journey in Europe.—VII.

IT was my pleasure and good fortune to meet Dr. C. Bolle in Berlin and to visit a number of interesting points under his direction and guidance, and this added greatly to the pleasure and profit of my stay at the capital. One rarely meets such an enthusiast in the study of trees as Dr. Bolle. He is indefatigable in his efforts to secure new things for his own grounds, as well as to procure trees which may be of economic value in Germany.

In his company I visited the newly planned Victoria Park, of which he has the general supervision. The situation comprises an elevated piece of ground, from the summit of which a considerable outlook is obtained. The summit is surmounted by a monumental structure in stone, which, happily, is not a counterfeit old ruin, as are many structures in Continental landscape-architecture.

Large Maples, Planes, Poplars, Elms and Lindens, some individuals with trunks almost a foot in diameter, have been transplanted to this piece of ground with a view to speedily obtaining park-like effects. By care in watering thoroughly and often, and in protecting the bark of the trunks from the heat of the sun, most of the trees appeared to have become well established. It is the intention to plant American Oaks instead of European species, for the curious reason that the former are considered as not so liable to have their foliage eaten by insects.

The trees of the city appeared to have scarcely suffered at all from the attacks of insects during the summer. The Gypsy Moth (*Ocneria dispar*) gives some serious annoyance here at times. About Berlin I found this insect most frequent on Poplars, but the caterpillars, chrysalids, moths or eggs were seen on a variety of trees, and in various parts of Germany, but nowhere in injurious numbers. Being interested in it, from the fact that the Massachusetts Legislature has appropriated such large sums of money for the purpose of suppressing it, I sought information from practical men regarding its ravages and the means taken to lessen them in Germany. It was generally stated that there were no organized public efforts to subdue this pest any more than any other troublesome insect, except the notorious Nonne (*Liparis monacha*), which attacks the coniferous forests, and there is private enterprise and self-interest enough to combat it when locally troublesome.

Although the injuries are some years quite serious, the natural parasites and enemies of the pest usually keep it very fairly in check, so that even if it is unusually plentiful one season the fact does not necessarily mean that it will be relatively more abundant in the year following. It is worth noting that, although the Gypsy Moth was once counted in the insect fauna of England, instead of increasing it has of late apparently become extinct, as it has not been collected on the island for many years.

Visits were made to a number of parks and plantations in the vicinity of Berlin, which are being planted under the direction of Mr. John Booth, one of the proprietors of the once famous Flottbeck nurseries, near Hamburg. Conifers are extensively used, and a decided preference is shown for some of our American species. Great interest and enthusiasm are manifested in the Douglas Spruce (*Pseudotsuga taxifolia*), which does remarkably well here and makes a very fast growth. Some fine specimens were shown, in full-fruit and from forty to fifty feet high. The change of name of this fine tree from *P. Douglasi* to *P. taxifolia* was commented upon; very naturally, it is not liked by those accustomed to the former name, and it will be some time before they become reconciled and accustomed to the corrected nomenclature. In some places *P. taxifolia* was shown as a distinct species from *P. Douglasi*, but, of course, without reason. However, some individuals of the Douglas Spruce are much more glaucous than others.

The Western Hemlock (*Tsuga Mertensiana*) is highly valued here, and great results are anticipated from plantings of Lawson's Cypress. In a sheltered situation and in fairly good soil, some specimens of the latter had attained a height of thirty-five feet in ten or twelve years. A large block of young Catalpa-trees was claimed to be *C. speciosa*, and complaint was made that it was not very hardy, being liable to more or less serious injury in winter. It is not easy to distinguish the two species, especially when young, but an examination of these plants showed that they were probably *C. bignonioides*. It is well known that this is less hardy than the other, although it will do well if not forced into too rapid growth when young, or after it has been established some years and a stem once attains good size by passing through several winters successfully. I was told that the temperature was sometimes as low as twenty-four or twenty-five degrees below zero of Reaumur.

Dr. Bolle's country retreat, known as Scharfenberg, is on an island in Lake Tegel, some miles out of Berlin and not far from Spandau. His estate is thickly stocked with trees and shrubs in large variety, all having been planted within the past twenty-three years. Here the Douglas Spruce is already over fifty feet high, and *Chamæcyparis Nutkænsis* nearly equals it. Another conifer of about the same height is here and in other gardens called *Abies lasiocarpa*, though many botanists consider it merely a geographical form of *A. concolor*. *Libocedrus decurrens* here proves quite hardy and is thirty-five or forty feet high; *Sequoia gigantea* does well, but *S. sempervirens* is liable to be killed in severe winters. The soil is sandy, and, of course, plenty of water is available for the trees.

As Dr. Bolle has, in his letters to GARDEN AND FOREST, given us occasional accounts of his experience and specimens and we may look for more, it is not necessary to speak further of his work now. On the way to his estate a long detour was made on foot to visit the old homestead of Alexander von Humboldt, near the lake. Although the Humboldt family is now nearly extinct, the present occupants keep the place in beautiful order, and it is so secluded and the surroundings are so natural that it is not easy to imagine it as in the midst of a populous country. Some fine avenues of very handsome Lindens are near the house. A tract of woodland in the vicinity had once been planted largely with American trees, and the largest individuals in it now are some fine specimens of the White or Weymouth Pine. This noble tree thrives perfectly in most parts of Germany, yet in many quarters it seems to be in disfavor, and one is surprised not to find it much more common as a timber-tree. In a given number of years it grows much faster and larger than the Scotch Pine, which is so universally planted. The lightness and comparative softness of the wood of the White Pine is considered its chief defect by European growers.

Every one who has heard of the famous Berlin street called Unter den Linden has perhaps pictured it as shaded by an avenue of trees of fine proportions. That, at least, had been my own conception of it, and, therefore, it was quite a surprise and disappointment to find the trees a varied assortment, none over fifty feet high, or with trunks over eighteen inches in diameter. Among them are Horse-chestnuts, Planes, Norway Maples, and occasionally an Elm, the first two kinds of trees

being the largest. Of course, numerically, the Lindens predominate, but none of them have stems over a foot thick, often much less, and the height is in proportion to the size of trunk. The tops have evidently been somewhat cut back from time to time. These trees are said to be very much older than their size would indicate, and their lack of vigor is due to the poor character of the soil. They are apparently well cared for and frequently watered. The Lindens planted here are chiefly what has been called *Tilia vulgaris*, with a few individuals of *T. ulmifolia* among them. *T. vulgaris* is the more attractive of the two, and in general aspect it is between *T. ulmifolia* and *T. platyphylla*, with most resemblance to the latter. That handsome Lindens do grow within the city is shown by some very fine specimens of *T. intermedia* opposite Doctor Bolle's house in the Leipsiger Platz. Other streets in this direction furnish some fine specimens of Horse-chestnuts, Oaks, etc., and in the famous Thiergarten, close by, there is no trouble in getting trees to thrive. Parts of this fine park impressed me as extremely sombre and damp and as though it would be an advantage to let in more light by a thinning out of the trees where greatly crowded together.

Arnold Arboretum.

J. G. Jack.

New or Little-known Plants.

Begonia Baumanni.

THIS new species, for the introduction of which we are indebted to Messrs. Lemoine, of Nancy, was one of the notable new plants of last year. The plant, well represented on page 77, will not only commend itself to growers of choice flowers by its grace of form and the beauty of its flower, but also for their distinctness of fragrance. Occasionally a slight fragrance has been observed among some of the tuberous Begonias, notably in *B. Maritani*, but it is usually only a suspicion. *B. Baumanni*, on the contrary, has a distinct pronounced Tea rose-like odor, which will not only make the species valuable to the growers, but offers possibilities of crosses with the large-flowered hybrids, which will enhance their value, especially for conservatory decoration. The Messrs. Lemoine recommend that this species should be grown in the open in full sunlight, in which position they are said to grow more sturdily. The flowers have already been described in GARDEN AND FOREST.

Messrs. Lemoine, this season, offer a new fragrant species, *B. fulgens*, which was discovered in the same locality as *B. Baumanni*, in the mountainous regions of Bolivia, near the Peruvian border. The flowers of this species are said to have a Tea rose-fragrance, and to be of a deep strawberry-red.

Elizabeth, N. J.

J. N. G.

New Orchids.

EPIDENDRUM PUSILLUM, Rolfe.—This is a small Brazilian species which has recently flowered in cultivation. It belongs to the section *Encyclium*, and in some respects is allied to *E. Tampense*, Lindl., a native of Florida, though much smaller, as it is only about five or six inches high. The sepals and petals are light green, irregularly freckled with light brown, the side lobes of the lip very pale green, and the front lobe pink, with some paler radiating lines.—*Gardeners' Chronicle*, December 5th, p. 669.

APPENDICULA PEYERIANA, Kranzlin.—A species introduced by Monsieur Peyer, from Sumatra, and flowered by Monsieur Ortgies, of the Botanical Garden at Zurich, Switzerland. It is a small *Dendrobium*-like plant, with long drooping branches, and two or three little white flowers enclosed in white bracts at the apex of the branches.—*Gardeners' Chronicle*, December 5th, p. 669.

ODONTOGLOSSUM × COOKIANUM, Rolfe.—A handsome natural hybrid which appeared with M. S. Cooke, Esq., of Kingston Hill, Surrey. It was received as *O. blandum*, which, however, is very different. The flowers are stellate, the sepals and petals deep yellow with smallish deep chestnut blotches, and the lip white, with a large bright chestnut blotch in front of the crest, and a few smaller ones near the margin. The sharp contrast of colors is

very striking. The lip is very similar to *O. Sanderianum* in shape, which species, or *O. blandum*, may have been one of the parents. As to the other, the deep yellow sepals and petals suggest *O. triumphans* or an allied species. It received an award of merit from the Royal Horticultural Society on November 14th last.—*Gardeners' Chronicle*, December 12th, p. 696.

MORMODES PUNCTATUM, Rolfe.—A new species of unknown origin which has recently flowered with Monsieur Gustav

glance. The segments are narrower than in the former, though otherwise similar, with the lip and column wings rather nearer to *O. Lindleyanum*. The flowers are yellow, with deep chestnut blotches, and bear a certain resemblance to those of *O. × Coradinei*, though more brilliantly colored.—*Gardeners' Chronicle*, December 19th, p. 728.

HABENARIA CARNEA.—A charming little species which has recently flowered in the Royal Gardens, Kew. It is a native of Penang, and was discovered by Mr. C. Curtis, of

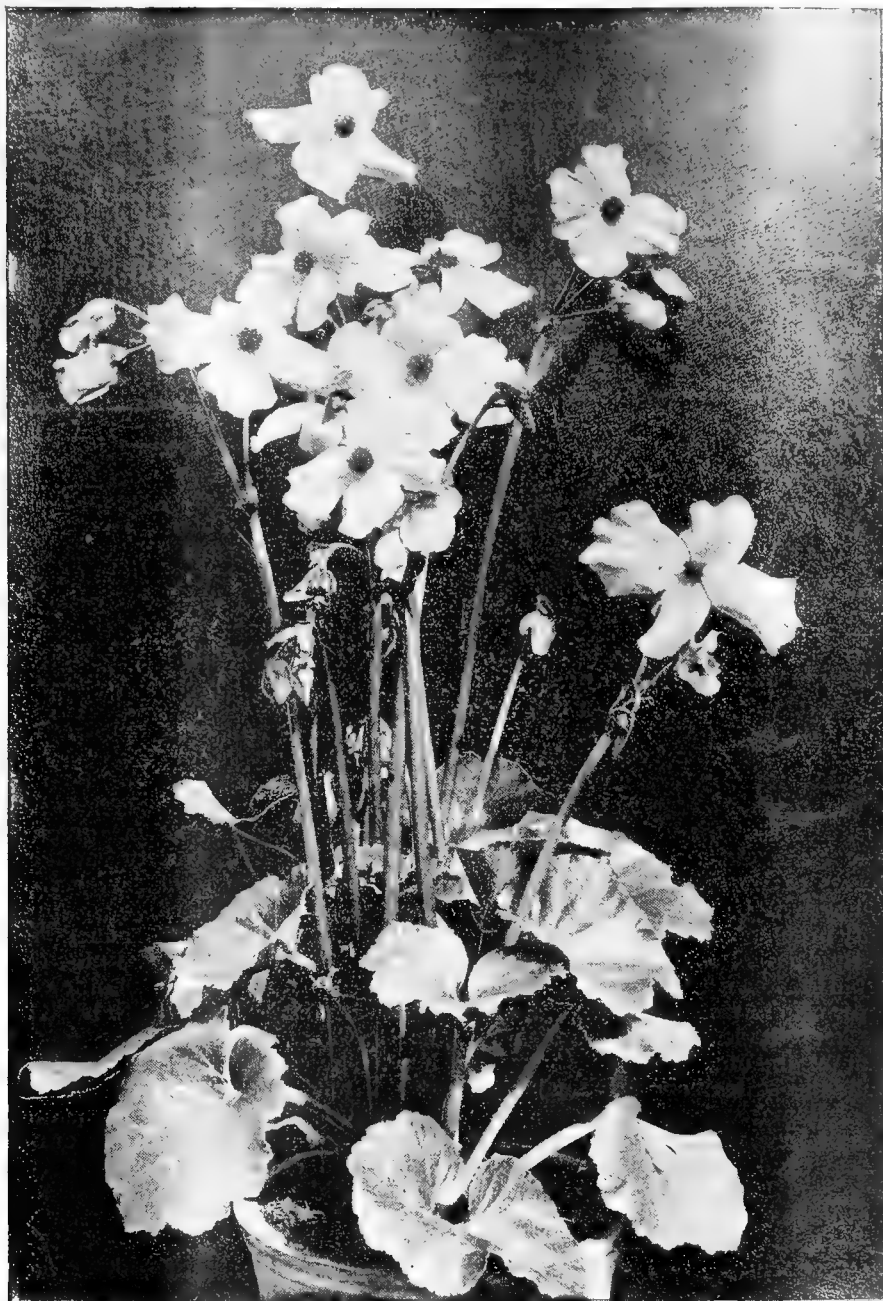


Fig. 13.—*Begonia Baumanni*.—See page 76.

Bral, of Mont St. Amand, Gand, Belgium. The sepals and petals are light yellowish brown, densely spotted with very dark brown, and the lip yellow with numerous small chestnut spots. It is allied to *M. Wendlandii*, Rchb. f., but with broader segments and other differences.—*Gardeners' Chronicle*, December 12th, p. 696.

ODONTOGLOSSUM × GODSEFFIANUM, Rolfe.—A handsome natural hybrid which appeared with Messrs. F. Sander & Co., of St. Albans. Its parents are evidently *O. triumphans* and *O. Lindleyanum*, whose characters are apparent at a

the Forest Department there. The leaves are deep olive-green, regularly spotted with white, thus making a very elegant contrast. The flowers are large, the lip white with a long light brown spur, and the other segments of a soft blush-pink.—*GARDEN AND FOREST*, October 14th, pp. 484, 487, fig. 76; *Gardeners' Chronicle*, December 19th, p. 729, fig. 105.

ODONTOGLOSSUM × IMSCHOOTIANUM, Rolfe.—A very interesting *Odontoglossum* which appeared in the collection of Monsieur Vanims-choot, of Mont St. Amand, Gand, Bel-

gium. It appears to be a natural hybrid between *O. Lindleyanum* and *O. tripudians*, as it is quite intermediate in character. It is much like the former in general character, except that the markings are rather more purple in color, but the lip is broader, and the crest and markings are more nearly as in *O. tripudians*. These two species are known to grow together, and the discovery of a hybrid between them is very interesting.—*Gardeners' Chronicle*, December 26th, p. 758.

Kew.

R. A. Rolfe.

Foreign Correspondence.

Bomareas.

THE genus *Bomarea* is closely allied to *Alstroemeria*, and is composed of about seventy species, all natives of high altitudes in Mexico and South America. They have usually long, slender, twining stems, clothed with ovate or lanceolate bright green leaves, with short, twisted petioles; the flowers are borne in terminal umbels and are generally large and bright in color. The root-stock is like that of a *Lapageria*, but the roots have the peculiar character of developing fleshy potato-like tubers, which appear to serve the purpose of food-reservoirs, as they have no buds, and are therefore valueless for purposes of propagation. The tubers of *B. edulis* are said to be eaten in St. Domingo like the tubers of the Jerusalem Artichoke, and those of *B. Shuttleworthii* are greedily eaten by pigs. The stems are usually annual, always perishing after they have once flowered, in this respect resembling the stems of *Liliums*. If the tip of the young shoot is broken, it will not break into growth again. The flowers remain fresh on the plants several weeks, and are developed at all seasons. Seeds are ripened by cultivated plants. The fruits are ornamental, especially after they burst open and reveal the bright red seeds.

Bomareas were not known as garden-plants in England until about fifteen years ago, when Mr. W. Bull, of Chelsea, introduced the handsome species now most generally grown and which was named after his collector, Mr. Cardis. Several were, however, cultivated in botanical collections long before this, *B. edulis* having flowered at Kew in 1814, when it was figured in the *Botanical Magazine*, at t. 1613, under the name of *Alstroemeria*. *B. Salsilla* also was grown at Kew in 1834. Dean Herbert writes as though he had grown some species of *Bomarea*, for he states in his *Amaryllidaceæ*: "They will be found to thrive best out-of-doors in this country in summer-time, and will endure the winter if planted pretty deep in light soil and covered over with leaves in the cold season, especially if any sloped heading be laid on to throw off the wet. Even *B. acutifolia*, which in the greenhouse keeps its leaves through the winter, will succeed with that treatment."

It is difficult to reconcile this statement with actual experience in the cultivation of *Bomareas* at Kew. Here they are grown in a large sunny house, which is devoted chiefly to succulents, the *Bomareas* occupying a raised bed at the side of the house, their stems being trained against the roof-glass. They are never shaded, and the temperature of the house seldom falls below fifty degrees in winter; in summer it often gets very warm. Under these conditions *Bomareas* thrive satisfactorily, some of them being in flower at all times of the year.

A few years ago a duplicate set was planted outside in a sunny south border and treated exactly as recommended by Herbert, but, notwithstanding protection during cold weather, not one of the species survived the winter. Another set was tried three years ago in the temperate house, strong plants being placed in the borders; but whether they were too far from the glass or the soil in the border was too damp for them they did not flourish, and had to be removed to more congenial quarters.

These experiments go to prove that *Bomareas* cannot be grown out-of-doors at Kew, and that they do best when planted in an elevated border in a warm sunny green-

house. The soil used for them is a mixture of equal portions of peat and loam with a little sand. This is placed over a thick layer of drainage. In summer the soil is watered copiously, but only rarely in winter.

Bomareas are propagated by means of seeds or by division of the root-stock in spring. It will be seen from the following descriptions of the species at present cultivated in England that these plants are possessed of qualities such as ought to gain favor for them in all gardens where greenhouse-plants are grown:

B. Caldasiana produces numerous stems annually, which grow to a length of about eight feet in a few weeks. The leaves are oblong acute, dark green above, paler below; the flowers are in umbels of from twenty to fifty, and they are an inch and a half long, the outer segments orange-red, the inner bright orange, with red-brown spots. This plant flowers all through the summer, and frequently all winter. It is in bloom at Kew now. It was introduced into England by Messrs. Veitch in 1865 from New Granada.

B. Carderi, when well grown, is one of the most magnificent climbers. Its stems are as thick as a goose-quill, twelve feet long, clothed with broad ovate leaves, and terminated by compound umbels as much as two feet in diameter, and formed of about forty flowers, which are almost as large as those of *Lapageria*. The outer segments are rose-colored, spotted with brown near the tips, the inner nearly white, with larger purple-brown spots. The umbels of flowers produced a few years ago at Kew and in the Pendell Court Gardens were a great attraction for several months. This species was introduced from New Granada by Mr. Bull and Kew simultaneously. It was at first called *B. Jacquesiana*. There does not appear to be much difference between this and *B. Williamsæ*. Young plants of *B. Carderi* have much narrower and thinner leaves than those of mature robust plants. This species flowers in about three years from seed.

B. edulis, according to Mr. Baker, is the commonest species in a wild state. It has many synonyms, owing, no doubt, to its variable character. It is the only one that has thriven in the temperate house at Kew, where it climbs up a pole to the height of twelve feet, and flowers freely all summer. The umbels are compound, and bear from twenty to forty flowers, which are an inch long, with equal segments, colored yellowish green, copiously spotted with claret-brown. The variety *Chontalensis*, which is figured as a species in *Botanical Magazine* (t. 5927), has larger, brighter-colored flowers.

B. frondea is a recent introduction, having been described and figured by Dr. Masters in the *Gardeners' Chronicle* from a plant flowered by Mr. Shuttleworth in 1882. It is now flowering freely at Kew. In habit and foliage it is not unlike *B. Caldasiana*, but the leaves are longer and Bamboo-like. The umbels are simple, and formed of from twenty to thirty flowers nearly two inches long, the outer segments half an inch shorter than the inner. The color is rich orange-yellow, with a few crimson spots and a tinge of red-brown on the outer segments, the inner being tipped with bright green. It is a handsomer plant even than *B. Caldasiana*.

B. oligantha was imported from Peru by Max Leichtlin and flowered by him at Baden Baden in 1877, when it was named and described by Mr. Baker. It is similar to *B. Caldasiana* in stem and leaf-characters and in its perpetual-flowering disposition. The flowers are one and a half inches long, the segments equal in length, the outer colored orange-red, the inner yellow with red-brown spots. The fruits are as large as a hazel-nut, much wrinkled, and, when they split open exposing the crimson seeds, they are as attractive as flowers.

B. Patacensis was introduced into cultivation by Mr. Shuttleworth from Patacocha, on the western declivity of the Andes of New Granada, and flowered by him in 1881, when it was described by Dr. Masters under the name of *B. conferta*, Benth. This name, however, proved to be a synonym of the above, as was pointed out in the *Botan-*

ical Magazine under t. 6692, where the plant is figured. Its stems, as grown at Kew, were from fifteen to twenty feet long, thickly clothed with leaves five inches long by one in width. The umbels, which are simple, are composed of from thirty to fifty flowers, each two and a half inches long and colored bright crimson, with bluish anthers. The Kew plant flowered in winter, but in the collection of Mr. Chamberlain, at Birmingham, it was in bloom almost the whole year round.

B. Salsilla is sometimes grown in the open border in the extreme south of England. It has rather small flowers on loose compound umbels, their color being mauve-purple. The stems are from three to eight feet long. It is figured in the *Botanical Magazine* as *Alstrœmeria oculata*, and is called B. *oculata* in some gardens. B. *Shuttleworthii* has broad leaves and yellow and orange-red flowers two inches long, with perianth segments equal in length. It was introduced in 1882, but I have never seen it in flower. Others which have been noted as garden-plants are B. *multiflora*, B. *vitellina* and B. *Kalbreyeri*. This last, according to Mr. Baker, is doubtfully distinct from B. *Caldasiana*. It is now in bud at Kew.

London.

W. Watson.

Cultural Department.

Five New Bulbous Plants.

THE bulbs of the plants referred to, three *Lachenalias* and two *Freesias*, were procured last summer, potted about September 18th, and have all flowered.

Lachenalia pendula superba is apparently only a fine seedling form of *L. pendula*. Its flowers are of the same colors—carmine, purple and green—and have the same drooping position, which gives the species its name, but they are very much larger than those of the type, both in length and breadth; some of the lower flowers were an inch and three-quarters long, while the upper ones were as large as the largest of the old variety. The flower-stalk was fifteen inches tall, and the leaves very long, broad and fleshy. The name *Superba* is worthily bestowed. It is to be regretted that the same adjective is applied to a variety of *L. tricolor*; there is too much confusion already in the nomenclature of *Lachenalias*.

L. Regeliana is undoubtedly a hybrid between *L. reflexa* and *L. tricolor aurea*, as the vendor states. Its flower-stalk is about twelve inches high, green, blotched with purple, the upper third all purple. The flowers of the main spike were about eighteen, of a rich deep yellow, except that the upper sepal is tipped with green. They incline somewhat upward, and the three upper segments are somewhat longer than the lower. In size they almost equal those of the variety *Superba*; they straggle along the stalk a little more than I wish they did. This is the most satisfactory among the *Lachenalias* in the quantity of its flowers. The bulb, not larger than a pigeon's-egg, gave seven flower-stalks and not less than eighty blossoms.

L. Comesii is evidently raised from *L. reflexa* and *L. quadricolor*, which is, I believe, a variety of *tricolor*. It is very pretty, but not equal to *L. Regeliana*. My bulb gave five flower-stalks, bearing from four to nine blossoms each. These are curved, about an inch and a half long, and stand out nearly horizontally from the stalk. Their general color is lemon-yellow. The three outer segments are somewhat shorter than the inner ones, and are tipped with green; the inner are tipped with crimson-lake. The coloration is derived from *L. quadricolor*, the position of the flowers from *L. reflexa*. This variety is interesting because it shows its parentage so plainly, but it can hardly take rank as an improvement upon many existing kinds. There is no doubt, however, as to the desirability of the two other varieties.

Freesia refracta purpurescens bears a flower as broad as it is long, of the same yellow tint as *F. Leichtliniana*. The outside of lobes and tube is very deeply stained with purple, and three of its segments are marked on the inside with large orange blotches of a very deep, strong shade. The general appearance of the flower is peculiar, and not entirely pleasing; it has, however, the delightful fragrance which we associate with the genus. The plant is very robust, the leaves about an inch broad, the flower-stem about twelve inches high, erect, rigid and branching, and, on the whole, hardly desirable, in my judgment.

Freesia odorata lilacina is declared by its originator to be "a delicate sky-blue or lilac" flower, provided it be grown in the open air. As seen in greenhouse culture I find its color not

much unlike the ordinary white form so extensively grown, for that sometimes shows nearly as much purple, externally, as this. The new variety has other good qualities worthy of notice. The flower-tube is less slender than in the common variety, and its lobes are much broader; the whole flower has much more substance, and appears whiter and more waxy, but its chief superiority is in its sturdiness. Its foliage is upright and strong; its freely-branching flower-stalk is twenty inches high and rigid enough to withstand heavy syringing. I think it a decided gain to horticulture.

Canton, Mass.

W. E. Endicott.

Perennial Plants from Seed.

FOR those who have greenhouses the time for seed-sowing is at hand, and a choice must be made at once of the plants upon which we are to rely for the display of the coming season. It may be a trifle early for many annuals, but all perennials of hardy kinds should now be sown if the convenience of a glass-house and a night temperature of fifty degrees can be provided. If their seed is sown now, most hardy perennials will flower this year like annuals, and will be in a way to give much better results another year.

The proper method of sowing seeds has been often described in GARDEN AND FOREST, but there are minor details concerning which some caution and counsel may be acceptable to amateurs who wish to raise their own plants. Some persons may question the wisdom of going to the trouble to sow seeds when a plant can be obtained as cheaply as a packet of seed, and all the trouble incident to raising the plants avoided. I can only reply that a true lover of plants enjoys such difficulties and uncertainties as challenge his patience and skill. But there are some plants which do not produce seed. *Veronica longifolia subsessilis*, *Dicentra spectabilis*, *Lychnis viscaria splendens*, the double *Lychnis Chalcedonica* and *Lychnis vespertina* are cases in point. The three last named are double-flowered forms, and the reason is plain, but in the two first named plants it is not so easy to understand why seed is never produced here. *Dicentra eximia* yields abundant seed at home, in Tennessee, but very seldom in New Jersey, while here again it seeds abundantly. The flowers of *Dicentra* have to be punctured by bees to obtain the nectar within, and perhaps the agency of various insects may explain this case.

Among the plants that may be sown now to flower the first year are most of the *Coreopsis*, many *Campanulas*, *Centaurea montana*, *Scabiosa Caucasicum*, *Delphiniums* of the formosum and grandiflorum type, including all garden forms, *Doronicums*, *Dracocephalums*, *Echinacea purpurea*, *Globularia trichosantha*, *Kniphofias*, *Linum perenne*, *Lathyrus latifolius*, *Lychnis Chalcedonica*, *L. Haageana*, *Platycodon Mariesii*, *P. grandiflorum*, *Polemoniums*, *Primula auricula*, *Pyrethrum uliginosum*, *P. roseum*, and the double-flowered forms. Of the kinds that will make good plants this season to flower well the next are *Aquilegias*, *Aconitum*, *Agrostemma*, *Dianthus*, *Dicentra*, *Echinops*, *Geums*, *Gypsophilas*, *Helenium*, *Hoopesii*, *Heuchera sanguinea*, *Lobelia cardinalis*, *Morina longifolia*, *Pentstemons*, *Saponaria ocymoides*, *Thermopsis Caroliniana*, *Statice latifolia* and other varieties, *Asphodelus luteus* and *A. albus*, *Primula rosea*, *P. Japonica*, *P. Sieboldii* and the perennial *Lupins*. There are some kinds that require special treatment, such as freezing, to induce them to germinate well, and it is not wise to sow any seeds of these kinds now; if sown in September many months of care and attention is avoided. *Trollius*, *Hellebores*, *Gillenia trifoliata*, *Anthericum liliastrum* and its variety, major, are all better after freezing. *Aquilegia cœrulea*, the beautiful Rocky Mountain Columbine, often comes poorly from seed, and it is necessary to sow every year a little seed, as the plant is a poor perennial; of one hundred plants about seventy-five will prove biennial, or die during the first winter. The seeds germinate better after freezing, but are very difficult to obtain true, and any one who is in a position to collect seed from wild plants would obtain speedy sale for it both here and in Europe. It is difficult to understand the lack of vigor in *A. cœrulea*, while *A. chrysantha*, which occurs in the same region, is the most vigorous Columbine we have. These two *Aquilegias*, with *A. Canadensis*, occur together in a wild state, but never or rarely mix, because there is a month's difference in time of flowering, but when they are planted in gardens near European kinds their individuality speedily becomes lost if they are perpetuated by home-saved seed. Many of us are still hoping for the re-introduction into cultivation of the rare *A. longissima*, figured in an early number of GARDEN AND FOREST. *Dictamnus Fraxinella* seeds freely, and should be sown directly it is ripe and placed in a shady place away from frost, when it will germinate in the spring following, and the same is true of all the *Alstrœmerias*, though these latter

when purchased are often old, and then sometimes take longer than one year to germinate. I have never been able to determine the exact rule of their conduct. Sometimes the seeds germinate freely when not freshly gathered, but oftener the reverse is true. Seed of *A. aurantiaca* gathered last fall and sown at once is now coming up nicely, while purchased seed sown a year ago is only just appearing. *Romneya Coulteri* is a plant that has puzzled many who have tried to raise it from seed; but a correspondent in California writes that it will not germinate until two years after sowing, whether the seed be fresh or not. I have from the same source seeds, both old and new, sowed in the same box, hoping to test the matter.

If seeds sometimes fail it is not always the fault of the dealer, but the lack of knowing just how to treat them. Very small seeds, such as those of *Campanula Carpatica*, are good, as a rule, for one year only, and will not grow when kept longer. They seem to become moldy in the moist atmosphere of dog-days. There is always abundant room for study in the matter of seed and seed-sowing, and the more one learns with regard

than a quite dry one. I have apples stored in a cellar into which an elbow from the furnace projects, and last year the fruit shriveled. This year the graveled floor is sprinkled once a day with water, and the result is very favorable. My apples are neither drying nor decaying. Those who store fruit are also aware that when the cellar is opened in spring to a full circulation of outside air the decay is much hastened. An equable temperature, as conditions allow, should be maintained. In city cellars fruit is more often lost on account of dryness than heat, and I recommend the sprinkling process.

By all odds the best place for storage is in bins about twenty inches deep, suspended along the middle of the cellar in two tiers. Barrels cannot so easily be looked over. There is a prevailing opinion that apples had better not be picked over or disturbed during the winter. This, of course, involves the waste of all partly decayed fruit. Stored in bins apples can be handled as often as necessary, if care is taken not to break rotting ones and get the sound ones infected by the decay. There really ought to be little loss from a cellar full of fruit. As fast



Fig. 14.—Florida Pines.—See page 73.

to perennials the more learning seems to be at fault. In old times, if seeds failed to grow, we used to blame the dealer, and the matter was settled, but sometimes after throwing out the pans a few seed that chanced to be washed over begin to grow, and then we wonder why.

Any one with a garden loses half its charm if he does not grow plants from seeds and watch them develop. Our best Orchid-growers say buy newly imported plants. You have to wait longer to see them flower, but you have the pleasure of doing your own selecting, and so it is with all plants raised from seed, whether they are annuals, perennials, tender or hardy.

South Lancaster, Mass.

O. O.

Late-keeping Apples.

NONE of our apples will resist peculiarly unfavorable conditions. An equable temperature is better than a low temperature. It is particularly unfortunate to store fruit in a drying atmosphere. A moist cellar, not really moldy, is better

as decay begins the waste should go to horses and cows—much to their advantage. I have stored over one hundred bushels this winter, and shall use, not lose, every bushel.

With these precautions, what sorts of apples are our best keepers? The Hubbardston and Belmont and Snow are not all gone before January, but they are of little value after that time. The Spitzenberg may be counted as a January apple. Pound Sweet will keep till April, but is not a good apple after December, besides needing constant watching. The Wagner is in its prime in January, and so is the Spy, but both will keep until April. The Greening has the happy power of holding its flavor until very late. The Kirkland, a native of this section, a seedling of the Bellefleur, is good for nothing before January, and at its best in March and April. The Jonathan holds its own until April—a small but most delicious fruit—a seedling of the Spitzenberg. Seek-no-further is excellent until March, and keeps easily. The Black Gillifleur is finest in January and February, but keeps into March. Baldwin keeps till April, and holds its flavor well. An occasional King will be in condition

till midwinter, but with me the end of them is, or ought to be, in January. The Roxbury Russet is better and better from January 1st until May. The Belle Bonne, sweet, is a superb fruit through January, February and March. The Ladies' Sweeting I do not value, but it keeps admirably till May. Grimes' Golden keeps well till April, a fairly good fruit. White Pippin keeps easily till April, and is a good late apple, handsome, smooth and large. Ben Davis keeps easily till April, but so will cobbler-stones. Tolman's Sweet keeps without trouble till March, but I cannot see that it deserves a place with Belle Bonne. Swaar holds out till May, and in good flavor all the time.

If I were to make out a list of best very long-keepers I would take Greening, Northern Spy, Kirkland, Jonathan, Seek-nofurther, Roxbury Russet, Swaar, Wagner, Belle Bonne. This list I hold to include all the best qualities until the last, and to give as little trouble as any. The Wagners are too delicious to be left out, but are not quite the latest keepers, counting retention of flavor. Those who are fond of Gillifleur may add that. The best baking apple in the list is the Roxbury Russet. My list is made out for the latitude of Boston and central New York, northern Ohio and the north-west. Farther south most of these apples mature earlier, and are not late-keepers.

Clinton, N. Y.

E. P. Powell.

Tomatoes.

EVERY gardener knows that in the past thirty years a great advance has been made in the general quality of our tomatoes. We also know that while the seedsmen's catalogues still contain long lists of the old ones we used to grow, hardly any of them retain the same characteristics more than two or three years after their introduction. The more careful seedsmen will select them into an entirely different type, while the careless one will let them run back to some inferior ancestor. After we leave the little Pear, Plum and Cherry Tomatoes it seems almost impossible to get a fixed variety. I thought that I had the Dwarf Champion as completely fixed as any could be, but from a lot of carefully saved seed one-third made strong running vines with fruit exactly like the old French Tree Tomato, from which the Dwarf Champion, no doubt, defined its habit. Others seemed identical with Acme, and none that had the dwarf habit showed any fruit like the French Tree. The fruit was reproduced, but the habit lost, though some of the smooth fruits on the dwarf plants had the color of the original Tree form. The whole lot was a strange mixture. This tendency to continually sport in new forms, or rather to revert to old ones, is doubtless the reason for the diversity of opinion in regard to varieties. Year after year I have sown seeds of Ignotum, which has received high praise elsewhere, but I have never yet had any but inferior fruit from it. Careful selection will usually give us a majority of good fruit, but I have long since abandoned all idea of getting a perfectly fixed variety. I look for little further improvement in Tomatoes, except, perhaps, in making perfectly smooth sorts out of the big ones, like Ponderosa and Mikado. For market purposes this is hardly to be desired, since sorts like Stern, Matchless, Brandywine and Beauty are much better, and the extra large ones had better be left to the amateur.

The large grower cultivates mainly for the canning-houses, and they demand a smooth, medium-sized, bright red solid tomato. The big ones, with green ends and large hollows, make too much waste.

Raleigh, N. C.

W. F. Massey.

Citrus trifoliata.—Your remarks on my note in regard to this plant are the first intimation I have had of its showing any degree of tenderness. The trees I planted eleven years ago in the uplands of northern Maryland, in a locality where the winter cold falls as sharply or more so at times than in New York City, have never shown any signs of tenderness, and fruit very abundantly. A gentleman in Ann Arbor, Michigan, who planted some at my suggestion, reported that they came through last winter. I do not know personally of any planting in New England, and am surprised to learn that they kill-back there. My plants in Maryland, on the terrible 1st of January, 1881, were exposed at noonday in a full sunshine to a temperature of four degrees below zero, with bare ground deeply frozen. They were little plants turned out of four-inch pots the previous spring, and had made long sappy shoots late in fall, as the plant is apt to do. I supposed that these late shoots would be killed, but, to my surprise, not one of them was hurt. I feel perfectly sure that, for all the Middle States and the south at least, this is the ideal hedge-plant.

Shrubs in Muck Holes.—Mr. Jack's notes on the European effort to grow Kalmias and Andromedas in water-tight tanks show how sensible gardeners often make sad imitations of nature's conditions. Any one who notices the growth of Kalmias and Azaleas on the northern slopes of our mountains could hardly fail to note that, while they thrive in cool and moist locations and a peaty soil, the localities are thoroughly drained by the rocky débris among which the roots wander, and moisture is due largely to the seepage of springs on the mountain-side above. No water-tight tank filled with peat meets these conditions. It reminds me of some of my early efforts to grow Rhododendrons in a limestone clay. I dug out deep beds and filled them with peat, and for a time the plants, in their imported balls of peat, bloomed, and I thought I had made a success. But the excavations in the clay, filled with the mellow peat, were only so many drainage-holes for the surrounding soil, and after three years of gradual starvation I found that the plants had not made a root outside of the original balls in which they came from Belgium, and every one could be lifted entire as though they had been in a pot, while the mass of peat in the bed was as sour as in its original swamp-bed. Some of these half-dead plants were removed and planted in the edge of a wood, on a steep rocky hill above the lime soil of the valley, and have since then grown with all the wild luxuriance of our native mountain plants. It is a bad plan to excavate beds for any plants in a compact clay, unless some arrangement is made for drainage. Such drain-holes in a compact clay filled with peaty soil might do for Arundos, Cannas and Caladiums, but never for the hair-like roots of our hard-wood forest shrubs.

Raleigh, N. C.

W. F. Massey.

Correspondence.

The Gypsy Moth and its "Extermination."

To the Editor of GARDEN AND FOREST:

Sir,—We have now had two seasons of legislative attack upon the Gypsy moth in Massachusetts, and can properly consider the desirability of its continuance and the best means of dealing with an insect whose destructiveness is conceded. Nearly \$100,000 have been spent—in the first year \$26,170.27—by a paid commission composed of men without special qualifications for their task, and who naturally went to work in a rather bungling manner, but succeeded in destroying, no doubt, a great many insects. When they were discharged it was supposed that the district over which the insect had spread from its original centre at Medford covered only about eight or nine towns, with an area of, say, fifty square miles, whereas in two or three months' time it was shown by the new unpaid commission (afterward the committee of the Board of Agriculture, but consisting in the two cases of the same persons, one of them a scientific man of high and deserved repute) that the moth had spread over twenty-one—now thirty—towns and cities, and an area at present estimated at about two hundred square miles.

In the second year, under the new control, \$68,616.60 have been spent, and the Board of Agriculture, in making its report, asks for a further appropriation of \$75,000 "to carry on the work according to the plans laid out [but nowhere stated] for 1892," and a resolution appropriating that amount for "continuing the work of exterminating the insect" has been introduced into the House. It is plain that no such sum should be allowed, and that whatever sum is appropriated should be directed toward preventing the spread and checking the ravages of the insect, and not toward its extermination.

This is not said in criticism of the work of the board the past season. It has worked under great disadvantages, and doubtless felt obliged under the "extermination" appropriation to leave untried no possible means of effecting its purpose. Men had to be trained to do the work, and few of them could have worked to their full efficiency until the close of the season, so that with the same force and the same expenditure vastly more could now be done than then. Nor, if we put aside the notion of extermination, can it be said that they were not successful. When three men in two days' time destroy over one hundred thousand caterpillars and chrysalids, and when more than three-quarters of a million of egg-clusters, representing from three to four hundred million possible caterpillars, are destroyed in six weeks by a force of less than two hundred persons, or over one hundred batches of eggs per day per person, we must believe that they have worked to good account. But one of the clearest proofs of their success is given in the fact that after the fall of the leaves, the men, now better experienced in the work and sharper-sighted, gathered

only about one-tenth as many egg-clusters as in the beginning of the year before the leaves were out. The work of the committee in fixing the boundaries of the infested district is also much to be praised.

But all this is not extermination, nor is it a great way toward it. It is an easy task to destroy a vast number of insects when they swarm. To wipe out the straggling and scattered remnant is an infinitely greater undertaking, nor could it be greater than with an insect which thrives on almost every green thing, and is spread over so wide a tract densely covered with vegetation. Not a half-million of dollars carefully spent would effect it. It must be remembered that the insect originated from a few individuals introduced into Medford; a few individuals left over from "extermination" would again introduce a reign of terror and frantic effort. What we now need is a patient and well-directed control over the increase and spread of the insect, and nothing more.

The report of the board assures us that the back of the offender is broken. There are now no large colonies. "Where in past seasons the trees bore neither leaves nor fruit, this year (1891) a good crop has been realized." The regions of their greatest abundance are well known and mapped; the position of every outlier is marked. Work for the future can be better and more economical because more intelligently directed. Work that was possibly justifiable when the insect swarmed, and when "extermination" was the fad, is so no longer. The cutting down and burning of brush sprayed with petroleum, similarly spraying and firing stone-walls, spraying indiscriminately with Paris green all foliage in a given district—work which the committee repeats is costly and very expensive—would be a reckless waste of effort and of money.

There are practically but two modes of attack on the insect: one while it is in the egg state, more than half the year, and when the leaves do not hide it; and the other for a few weeks only, while it is a roaming caterpillar, more or less concealed. The director of the field-work the past year, speaking of the former, says, "experience has shown that this is the most practical method of dealing with the moth." The details of the report bear out the assertion.

If, then, work is to be directed simply to keep the insect well in check and prevent its spreading, no such expenditure as was made last year is at all needed. A steady force of twenty, or possibly of ten trusty men skilled in the work, and under efficient direction, ought to suffice for two or three years. They could go systematically over the ground for eight months in the search for eggs, and for the remainder of the year on watch against outbreaks, and when such outbreaks occur the caterpillars could be captured and destroyed by the best devices, and the trees next to roadways could be specially guarded. No doubt we can learn by longer practice still better and more economical means of contesting the ground with the foe. It might be well to add a small bounty to boys for every ounce of eggs delivered, though they are now prohibited from aiding in this way, for fear that, in removing them from the trees, some eggs of the cluster may be left behind—a precaution bred of the "extermination" craze.

Cambridge, Mass.

S.

Aquatics at Farview, Staten Island.

To the Editor of GARDEN AND FOREST:

Sir,—The southern end of Staten Island has long been a favorite residence of New York families, and all the eligible locations outside of the Government reservations held for the harbor defenses are occupied for country-seats, generally handsome residences and extensive pleasure-grounds. The island at this part rises rapidly from the beach, with a succession of gently sloping eminences known as the Dongan Hills. Farview, the estate and summer home of Justice C. L. Benedict, of the United States District Court, bears an entirely appropriate name, for the handsome villa commands one of the most remarkable outlooks in the vicinity of New York city. At the south-west the eye ranges over Raritan Bay at its widest, with Sandy Hook in the dim middle distance, while to the left the noble entrance of New York harbor is in full view. The Narrows at the east are always full of the movement of the commerce of the port, and present a constantly changing picture, full of life, no sound of which reaches the observer. The view at the north is bounded by irregular hills, while at the west the ridge which makes the backbone of the island furnishes a quiet sylvan view in contrast to the others. Such a site seems to be an ideal one for a country retreat for a dweller in a large city, for here he can enjoy quiet surroundings, with the suggestion of activities in full view, and yet without disturbance.

The extensive grounds of Farview are mostly well-kept lawns. There are a few good trees on the place, though many have been thinned out for interfering with the outlook. Coniferous evergreens are used freely, with a good collection of the smaller sorts. Some beds of hardy perennials are gay in their season, as are the many tender plants. But the charm of the place to many would be the Lily-tanks, which, in the summer, under the supervision of your correspondent, Mr. Wm. Tricker, have become famous. Mr. Tricker will be remembered by many as the first man in this vicinity to grow large exhibition-blooms of Chrysanthemums and as a winner of first prizes for several years. Mr. Tricker, besides being superintendent of the estate, has become a trade grower of Chrysanthemums and aquatic plants. It was especially to see the latter in their winter quarters that I called a few days since.

The borders of the outside tanks were covered with littery manure and evergreen boughs to prevent the walls from being broken by the frost. The water was retained in one deep tank, while from another it was drawn off and the rhizomes deeply covered with leaves. Both methods are said to preserve the hardy *Nymphæas* successfully in this latitude. In the houses I found a very large and complete collection of *Nymphæas* in all stages, which were especially interesting, as their propagation in quantity is a comparative new industry, and in some respects is still somewhat tentative. Mr. Tricker seems to have succeeded admirably, having new houses fitted up gradually as experience suggested. Besides the half casks in available spaces, where proper temperature could be secured, used to store stock, the plant consists of shallow wooden tanks, zinc-lined, occupying the bench room of a low span-roofed house. These are heated with a one inch pipe led from the four-inch floor and carried back to the return. Mr. Tricker thinks this furnishes too much heat, especially when the main pipes are very warm. Seedlings are grown in flats and pots plunged in these tanks and shifted on as they develop. It is a simple matter to germinate seeds of *Nymphæas*, but the necessary warmth as quickly develops algæ, and the problem is to carry the seedlings through the weak stage without being suffocated by those minute organisms. The necessary trouble would scarcely commend itself to a small grower. Possibly the difficulty may be obviated by arranging for a flow of filtered water at proper temperature. Judging by the stock grown, the favorite *Nymphæas* seem to be *N. Zanzibarensis*, *N. Devoniensis*, *N. dentata*, *N. chromatella*, *N. alba candidissima*, *N. odorata rosea* and *N. speciosa*. Monsieur Martiac's newer kinds, *N. albida*, *N. sulphurea*, *N. rosea* and *N. exquisita*, are still very scarce, and hardly known to ordinary growers. *N. flava* has been discarded here, *N. Mexicana*, though very close to it, being much freer in flower. The beautiful seedling of Dr. Bahnsen's, described in GARDEN AND FOREST as *N. superba*, is being distributed from here as *N. Caroliniana*, and promises to be a vigorous plant.

Elizabeth, N. J.

J. N. G.

Hardy Broad-leaved Evergreens.

To the Editor of GARDEN AND FOREST:

Sir,—This place is nearly in the latitude of Philadelphia, but the ocean is only thirty miles away on the east. Tide-water in the Delaware River is about the same distance on the west, and the ocean about twice that distance on the south. Our soil is light and warm, and I have noticed that cold waves reported as coming across the country are quite apt to be headed off by a counter current from the ocean, and therefore fail to reach us. These conditions should be kept in mind in order to check or explain some statements I am about to make in response to Mrs. Dandridge's request for experience with half-hardy plants. *Magnolia foetida* does finely without protection. I have one which is now going through its third winter, and there are three standing singly and fully exposed in the lawn connected with Mr. Parry's nursery, about six miles north-east from Philadelphia, but on the New Jersey side of the Delaware. These were planted in 1887, and were then two to three feet high. I suppose they are now about fifteen feet high, and pictures of health and vigor, and one of them produced seven flowers last summer. The only injury they have received is from retaining so much snow as to break some of the branches, but they are at present full and symmetrical, and show no signs of ever having been injured in this way. I should feel safe to plant it anywhere in the southern half of New Jersey, and there are many places nearly as far north as Philadelphia where it will succeed in favorable positions. *Araucaria imbricata* has stood out here for twenty years, and has never been injured by cold except in one unusually severe winter, when a portion of the top was killed. It is now thriving again, although it grows

quite slowly. It is in very poor sandy soil, and has had little or no care. This tree may not be properly classed with broad-leaved trees, but it bears very little resemblance to ordinary coniferous evergreens, and in fact has about as much the appearance of a Cactus. It is always of a dark rich green, and a very interesting tree.

Lonicera fragrantissima is very nearly evergreen here, and I think would be so a little farther south; it is a very desirable plant, producing its very sweet-scented flowers all through the spring months, and often having both flowers and ripe berries in May. The Japanese Privet is yet full of leaves, and although it makes a very regular upright growth, which is rather stiff and formal, it is desirable in some positions. We have growing wild in the wet swamps near the Mullica River a vine which is greatly superior to the Bitter Sweet as an ornamental berry-plant. I allude to *Smilax Walteri*. It grows, so far as I have observed, invariably where the ground is fully saturated with water, and usually among dense thickets of Alder, *Andromeda*, *Azalea*, etc., and its slender stems attach themselves by tendrils to these shrubs, and produce in great profusion very compact small clusters of brilliant light scarlet berries about the size of those of *Ilex verticillata*, which remain on all winter. I have never seen this in cultivation, and it might not be hardy so far north if removed from the water. It would be almost impossible to dig the plants from the thickets where they occur, but seeds sown in pots or boxes at this season and placed under the greenhouse benches come up freely in spring. It is one of those plants which have been neglected quite too long, and most certainly would succeed wherever even a narrow strip of low marshy land lies along slow-running streams, if not on upland. It is not nearly as thorny as some other varieties of *Smilax*. It is not evergreen, but if it was desirable to plant an evergreen vine with it *Smilax laurifolia*, which also grows in similar situations, or a little nearer to the upland, would serve the purpose.

Hamonton, N. J.

William F. Bassett.

Recent Publications.

The Silva of North America, a Description of the Trees which grow naturally in North America, exclusive of Mexico, by Charles Sprague Sargent, illustrated with figures and analyses drawn from nature by Charles Edward Faxon, and engraved by Philibert and Eugène Picart. Volume III. *Anacardiaceæ—Leguminosæ*. Large 4to, pp. 141; 50 plates. Houghton, Mifflin & Co., Boston and New York.

The third volume of Professor Sargent's *Silva of North America*, which has recently appeared, is devoted to the illustration of the trees which belong to the families of *Anacardiaceæ* and *Leguminosæ*, and completes, we should imagine, a quarter of the whole work. So far as trees are concerned, North America is not rich in representatives of either of the families treated of in this volume, as compared with some other parts of the world, where, especially in the tropics and in Australia, arborescent *Leguminosæ* abound, while in the smaller and less-interesting family of the *Rhuses* are many exotic genera with arborescent representatives. Of the trees of this family which are included in our *silva*, none are especially valuable to man, although among the American *Sumachs* will be found some of the most ornamental of the smaller trees. This volume begins with a description of the American Smoke-tree (*Cotinus Americanus*), the genus *Cotinus* first established by Linnæus and afterward united with *Rhus* being here, contrary to the custom of most American authors, maintained principally, no doubt, on account of the remarkable growth of the pedicels of the sterile flowers, which lengthen after the flowering period, and turning bright-colored give the peculiar aspect to the plants of the genus which has made the Old World *Cotinus* so prized in gardens. The American Smoke-tree is one of the rarest of all our trees, growing only in two or three isolated situations from the mountains of northern Alabama to western Texas. The distribution of the genus is interesting and rather unusual; two species only are known; one of these, the Venetian *Sumach*, or Smoke-tree, is a common plant of southern Europe, ranging east through some parts of India to northern China, without, however, reaching Japan, while the second, barely distinguished from its Old World prototype, has only just succeeded in maintaining itself in the New World, from which it seems destined to disappear at no very distant day.

Of the true *Rhuses* five species are here considered to become North American trees, four belonging to the Atlantic, and one to the Pacific flora. *Rhus Metopium*, a handsome, although exceedingly poisonous, West Indian tree, inhabits the keys of southern Florida. Two *Sumachs*, *R. typhina* and *R. co-*

palina, are represented by beautiful figures, those of the former perhaps the most attractive in the volume; certainly none others better display the artist's patient labor or his artistic method in the arrangement of his material. More interesting, perhaps, than any of the *Sumachs* is the familiar Poison Dogwood of our northern swamps (*R. Vernix*), on account of its near relationship to the Japanese Lacquer-tree. Of the cultivation and uses of this tree in Japan, the most valuable of all the *Rhuses*, the reader will find most interesting information embraced in the copious notes upon several exotic species which the author has appended to his general description of the genus *Rhus*. Here, too, is an account of Chinese galls, excrescences found on the leaves of *R. semialata*, a beautiful tree now well known in our gardens; of the Vegetable Wax of Japan, the product principally of *R. succadadenea*, and of the European *R. coriarea*, which furnishes the larger part of the *sumach* of commerce, and of its cultivation. *R. integrifolia*, the only California representative of the genus described, is usually a low shrub, covering with almost impenetrable thickets vast wind-swept areas exposed to the ocean in the southern part of the state, and occasionally, especially south of the territory of the United States, a tree with a short thick trunk.

It is an interesting fact that no arborescent representative of the family of *Leguminosæ* grows naturally in California beyond the desert region of the south, although the family, in many shrubs and in almost numberless herbs, furnishes one of the most marked features of the California flora. Of the genus *Dalea*, a New World group of a hundred species, there is one representative in *The Silva* (*Dalea spinosa*), a small contorted bushy tree of the Colorado desert, which, perhaps, a less conscientious author would have dropped entirely in a work on trees, as it is usually a shrub, and, except for the small amount of soft, light and usually half-rotten wood its stems might furnish to a traveler lost in the desert, of no value whatever. Frémont discovered it in one of his transcontinental journeys, but it was Thurber, years afterward, who made its characters known, and to this excellent and learned man, whose death was announced in these columns a year or two ago, the author here pays a fitting tribute.

A few small *Mimosæ*, one of the great divisions of *Leguminosæ*, cross our southern borders from Mexico, east of the Rocky Mountains, and are sometimes, especially in the valley of the lower Rio Grande, rather conspicuous features of vegetation. They are representatives of *Acacia*, *Leucæna*, *Pithecolobium* and *Prosopis*; among them is the well-known *Acacia Farnesiana*, one of the most widely distributed of all trees, and an inhabitant of Australia as well as of many parts of tropical America. This is the *Cassie* of the French, who cultivate it in all the territory bordering the Mediterranean for the perfume which is extracted from the flowers. But the most important of all the *Mimosa* group of North America is the Mesquite (*Prosopis juliflora*), the most valuable of all the North American arborescent *Leguminosæ*, and one of the most valuable of trees in view of the fact that it has the power, through the immense development of its roots, which sometimes penetrate fifty or sixty feet into the ground in search of water, to grow in regions so arid that no other tree can survive there. The Mesquite furnishes the only fuel produced in an enormous region, and the best fodder, for the sweet pulp which surrounds the seeds enclosed in long pods is devoured by all herbivorous animals, and furnishes a valuable article of food to Mexicans and Indians.

In this volume, too, will be found accounts of many trees now familiar in the gardens of the United States and in those of Europe—the *Virgilea*, the Kentucky Coffee-tree, the Three-thorned *Acacia* and its relative, the Water Locust, the Red-buds, and the Locusts—and of a few that are not as well known to the general reader, such as *Olneya*, a beautiful inhabitant of the deserts of Arizona and Sonora; *Ichthyomethia*, the fish-poisoning tree of the Caribs and an inhabitant of southern Florida, as well as of the Antilles; the two Texas *Sophoras*, handsome small trees of a genus known in our gardens in its Asiatic representative, *Sophora Japonica*, and the *Cercidiums* or Green-barked *Acacias*, curious trees of the territory of the Mexican boundary, which they enliven with their bright green branches, destitute of leaves during a large part of the year, and their brilliant yellow flowers.

But a mere enumeration of the trees contained in this volume can give but a very faint idea of the character and extent of the information which it contains. This is not confined to American trees alone, for under the description of the genera included in the work will be found, in the form of notes, a vast amount of important and curious information relating to the principal trees of each from other parts of the world—the

fruit of years of study and careful preparation, much observation and many long journeys. And, in turning over these handsome pages, it is hard to realize sometimes how much information is contained in a few lines of one of the short notes, or in what convenient form it has been conveyed to the reader.

Notes.

In an article in the *New York Sun* on Photography, by Mr. George Iles, it is stated that Mr. Olmsted, the designer of the exhibition-grounds at Chicago, receives photographs of the grounds once a week, which show how his plans are taking form. In such a report there can be nothing forgotten or glossed over.

The Worcester County, Massachusetts, Horticultural Society will celebrate on the 3d of March the fiftieth anniversary of its incorporation. An address, historical and narrative, will be delivered in the hall of the society in Worcester in the afternoon by its President, the Hon. Henry L. Parker, and in the evening a banquet will take place.

The Torrey Botanical Club, of this city, announces that the prize of fifteen dollars offered last spring for the best set of plants collected within one hundred miles of New York has been awarded to Miss Anna Murray Vail, whom our readers will remember as the author of several interesting articles published during the past year in GARDEN AND FOREST.

The new Rose, Hugh, which originated with Mr. F. S. Moore, of Chatham, New Jersey, is highly spoken of in the *American Florist*. It is a sport from Catherine Mermet, and the flower has that peculiarly deep shade of pink which is occasionally found in the very best flowers of that variety. It is large, full, well formed, and is said to be a strong grower.

The Genesee Valley Forestry Association, of which Mr. A. S. Hamilton, of Rochester, is President, and Wheelock Rider, of the same city, is Secretary, seems to be an alert and vigorous young body. Its Executive Committee has recently issued an address to the people of western New York calling attention to the desirability of the preservation and renewal of forests, and giving reasons why systematic forest-culture should begin at once in that region.

The Japanese consider it especially difficult to arrange Chrysanthemums, and seven faults are noted which must carefully be guarded against in disposing of large blossoms of this plant. A blossom must not present its back in a composition, nor yet turn its full face to view; the different flowers must not have stems of the same length; three must not be arranged in a triangular form, nor may any number be placed in a regular step-like way; the flowers should not be hidden by leaves, nor should a large open blossom be put near the base of the composition; and, finally, the artist must not fall into the sin of color-sandwiching, or placing a blossom of one color between two others of another tint.

The early commencement of the publication of a *Prospectus Floræ Africae* is announced by Th. Durand, of Brussels, and H. Schinz, of Zurich, in which they propose to bring together and condense the immense mass of information relating to African plants which is now so scattered through different publications as to be unavailable to the ordinary student. The work when completed will embrace some 20,000 species and 80,000 synonyms, including the new species collected by different travelers in Senegal, Angola, at Zanzibar and on the upper Congo. The price of the work, which will be published in six volumes, is 120 francs (about \$20) to subscribers, who can communicate directly with either of the authors.

In a late bulletin of the Michigan Agricultural College a report is made as to the comparative value of a hundred and twenty-eight varieties of Strawberries tested there. Each variety has been grown both in matted rows and in hills, and from the table it is shown that almost uniformly the yield of fruit under the hill system is much greater than that from the matted-row system. Nor is this the only advantage of planting in hills, because the increase does not come so much from a greater number of fruits as it does from their greater size and beauty. The following varieties are named in the order of their maturing as a select list for home use throughout the season: Alpha, Haverland, Parker Earle, Belmont, Parry, Mount Vernon and Gandy. This year Parker Earle yielded a greater weight of fruit than any other variety, and it did the same last year.

Chief-Justice Hagarty, of the Province of Ontario, administrator for Lieutenant-Governor Campbell, in the speech with

which he opened the session of the Legislative Assembly, at Toronto, last week, stated that a commission had been appointed to report upon the desirability of establishing a forest-reservation and park in a portion of the Nipissing District south of the River Mattawa. The proposed reservation is situated on the height of land in which the rivers Amable du Fond, Pettewawa, Bonnechère, Madawaska and Muskoka have their sources. It is to be hoped that the report of this commission, which is to include a discussion of the proper methods of maintaining and managing the reservation, will be such as to meet the favor of the Legislative Assembly. In this country we already have some reservations, and are endeavoring to secure more of them, but as yet we have no scheme for maintaining them as a forest should be maintained, if it is to serve its highest purpose.

Professor Bailey, in a late bulletin from the Cornell Experiment Station, gives an account of some trials made there with *Stachys Sieboldii*, the comparatively new vegetable which has also been introduced under the names of *S. affinis*, *S. tuberosa* and as *Crosnes du Japon*. In cultivation here it is a small perennial plant with the aspect of Peppermint, and there is some doubt among botanists as to whether it is really distinct from the common wild *S. palustris*, which grows over a large part of North America. Its value as a food-plant lies in the white tubers, which are thickened underground stems, like potatoes. Although they are small, they are produced in such abundance that the plant yields heavily. After eating the tubers prepared in several ways, Professor Bailey pronounces the plant, in his view, the most important addition to our list of secondary vegetables which has been made in several years. The tubers can be prepared in a great variety of ways—fried, roasted, baked, pickled, preserved, stewed in cream and made into fancy dishes, or they may be eaten raw. They may be dug as wanted during the winter, and, ordinarily, enough of the roots will be left in the ground to ensure a supply in the following year. Much of the value of the tubers depends on their crispness, and they must, therefore, be kept in earth or in moist shavings, for they will shrivel in a few hours if exposed to the air. The plant lacks a good common name, and Professor Bailey suggests *Chorogi*, by which name it is known in Japan.

Mr. J. W. Wibbe writes to the *Bulletin of the Torrey Botanical Club* that he had long doubted the assertions of several acquaintances who declared that the Musk-plant (*Mimulus moschatus*), which is so old a favorite for indoor cultivation, grew wild in Saratoga County, in this state, but that last July he saw it himself. Driving along the Kayaderoseras to the mouth of a famous trout-stream called Moorehouse Brook No. 1, about a mile north-west of Middle Grove village, he says "The very first things I met here after crossing the bridge were whole patches of the *Mimulus*, hanging over the banks of the brook-let with their frosty foliage perfuming the whole atmosphere. Following the course of the water the plant was found wherever a clear space was left for the sun to shine upon the loamy soil. About one mile up the creek, in full view of the foot-hills of the Adirondacks, the plant has its headquarters in a springy swamp, growing in all directions in the midst of the water, often two feet high. A trapper informed me of having known the plant here always and nowhere else in the neighborhood. How this far-western plant came there I am not able to tell, but it is there and in great abundance." The editor of the *Bulletin* adds that the *Mimulus* was also found a few years ago growing in a boggy swamp about two miles east of Locust Valley, in Queens County, on Long Island, "perfectly at home, and scattered over a considerable area," and that a specimen from this locality is preserved in the herbarium of Columbia College.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLES:—The Tree as a Schoolmaster.....	85
A Professorship of Forestry at West Point.....	86
The Elms of the St. Lawrence Valley..... <i>T. H. Hoskins, M.D.</i>	86
Notes of a Summer Journey in Europe.—VIII..... <i>F. G. Jack.</i>	87
The Swan's-neck Orchids..... <i>R. A. Rolfe.</i>	88
NEW OR LITTLE-KNOWN PLANTS:— <i>Symplocos crataegoides.</i> (With figure.).....	90
<i>Clematis paniculata.</i> (With figure.).....	90
<i>Prunus hortulana.</i> <i>Professor L. H. Bailey.</i>	90
CULTURAL DEPARTMENT:—The Adulteration of Copper Mixtures,	
<i>Fungous Troubles in the Cutting Beds.</i> <i>Professor L. L. Van Slyke.</i>	90
The Vegetable Garden..... <i>Professor Byron D. Halsted.</i>	91
<i>Anemone Japonica.</i> <i>Professor W. F. Massey.</i>	92
<i>Solandra grandiflora.</i> <i>T. D. H.</i>	92
The Kaffir Lily..... <i>M. Barker.</i>	92
CORRESPONDENCE:—In the Shore Towns of Massachusetts.—VII. <i>J. B. Harrison.</i>	93
RECENT PUBLICATIONS:—The Pepino, <i>Solanum muricatum.</i> <i>Professor L. H. Bailey.</i>	95
NOTES.....	96
ILLUSTRATIONS:— <i>Symplocos crataegoides,</i> Fig. 15.....	89
<i>Clematis paniculata,</i> Fig. 16.....	91

The Tree as a Schoolmaster.

TO those who study it with care and sympathy, the tree is always teaching lessons which help to enlarge and elevate the mind. From it can be derived instructions of profound significance, of high philosophy, of practical suggestion, as one considers its meaning, its history and its economic value in the world.

First of all it teaches man to reserve judgment by showing that the insignificance of a germ is no criterion of the magnitude of its product, that slowness of development is not an index of the scope of growth, and proves to him that the most far-reaching results can be attained by very simple means. A barrel of acorns may be the nucleus of a forest that shall cherish streams to fertilize a desert, a handful of Cedar-cones may avert an avalanche, while a bushel of Pine-seed may prevent the depopulation of a great section of country by mountain torrents.

Studying little by little the influence of the forest, we come to understand the intimate relation between man and nature—that relation which is a struggle of rival forces, in which the silent, mighty mother inevitably wins the battle. If at the first glance man seems her ruthless adversary, the tormentor of the earth, the wrecker of woods, the destroyer of beauty, the boastful pigmy who would assault a colossus, we soon come to learn that in wronging her he but evokes a doom as sure and terrible as his assault has been reckless and violent.

Like the fierce blow of Thor's hammer upon the face of the giant Skrymir, mistaken by that mighty one for the fall of a leaf, the puny strokes of man, though they may scar, cannot destroy, and when the Earth giant awakes from slumber it is to confound the weak assailant with a sense of the impotence of his fancied strength. Then one hears once more the mocking laughter of the Jötuns at the baffled mortal, and hears the echo of their scornful cry, "Better come no more to Jötunheim."

Of the tree man in due course learns the law of the survival of the fittest, since in the end the forest must prevail

if he but cease his vigilance. He learns it in the struggle of the monarch of the woods to reach above its fellows in the hungry roots which dwarf less vigorous growths in its broad arms, which push aside its weaker companions; in the crown of leaves which overshadow its lesser rivals; in the powerful shaft that thrusts its lance skyward above the surrounding conifers; in every effort of the tree-king to assert its right to supremacy above the others.

Then comes the study of the tree's prodigality of production, the enormous care for the protection of the species, the thousands of seeds yielded for one that germinates; that endless provision for the future forest; that patient shelter of the youthful sapling which shall gain nourishment from the decay of parent leaf and stem.

Slow, beautiful and sure is the yearly development of the young tree. Without haste and without rest it stretches upward, adapting itself to its environment, as man to his. But, unlike him, it will not readily be weaned from its natural surroundings. The Willow clings to the stream, the Chestnut to the stony hill-side, the Pine and Fir to the mountain-top; and in the useful ends they serve, each in its proper habitat, we learn another lesson of simple duty and faithfulness to our daily lot. Does the Spruce-tree quarrel with its sea-smitten crag? the Maple with its forest-seclusion? the Cedar with its lonely swamp? Does the Oak seek to divest itself of its twining Ivy? the Birch sigh to escape from its marriage with the Pine. Not so; and here again they preach a needed sermon to the restless race that frets away its uneasy life beneath their shade.

Not even when the fall approaches does your tree put on a wintry countenance. Rather does it array itself in gold and purple for its last pageant, strewing the earth with a splendid carpet, which enwraps the new fallen seed or nut, and thus ensures to it a future growth. Even when the last leaf clings to the stem, the tree is a fair sight to those who truly love it and can rejoice in the exquisite outline presented by its denuded branches, the soft interlacing of its twigs, the fine curves of limb and bough, the rosy brown shadow of its tips closely interwoven in a thread-like web against the pale blue of a winter sky.

Even so a fine character meets disaster and loss, braced for the blast. What matters it that adornments are shorn away if the revealed life is full of vigorous beauty, of unconquered energy, of powerful promise, shall not the future of the brave though shivering tree give courage to the man shorn of his wealth or joy to put forth buds of hope for a spring that is to come? Thus does the tree as a schoolmaster lead man from the great preliminary lessons of eternal law and progress, of development and growth, down to the more homely and needed schooling in patience, endurance and calm confidence in a hopeful future.

Then, when its economic uses are to be considered, a wide field opens to the tree-student, as he learns how great a part it plays in every enterprise of man. To it he owes his dwelling and his boat, his oar and his weapon, often his clothing, and his meat and drink; it has modified his character, determined his history, and been a staple of his commerce with other lands. Far-reaching has been its influence upon the race from prehistoric days until the time when the wooden walls of England became the bulwark of that liberty of which our independence is the outcome. Thus the story of the tree leads to the history of the race, which it has so strongly influenced, and opens out the whole human horizon to its pupil. Hence he who makes a companion of trees and seriously seeks to learn the secret of their importance, finds his own mind and knowledge constantly expanding with the effort to master this ever-widening topic.

As the subject grows he himself grows, his silent but wise instructor conducting him step by step to higher and wider outlooks; to a more comprehensive grasp of information; to a keener understanding of humanity; to a deeper reverence for nature; while filling him with unending surprise at the educational resources of that school-

master which has opened to him the door to the whole world of knowledge.

IN our issue for January 20th appeared extracts from an address before the Forestry Convention, in Washington, by Mr. J. D. W. French, in which was advocated the employment of the army to protect the forests of the national domain, and especially the forest-reservations recently created by the President. In connection with this Mr. French suggested a Professorship of Forestry at West Point, and a school in one of the western reservations to teach the soldiers practical forestry. There are few things more depressing than the dull routine of camp-life on the plains, and it is small wonder that so many enlisted men desert from the army. There is a strong movement in favor of increasing the facilities for giving instruction to our soldiers in time of peace, and no doubt a better class of men would enter the service and would remain in it if some plan of wholesome mental discipline was devised. Mr. French's suggestion, that the men should have some instruction in woodcraft, is an admirable one, and it would furnish them with a kind of schooling which does not necessitate confinement over books.

We have lately received, through the kindness of Mr. Fernow, a letter which was sent to the Forestry Division by Mr. Abbot Kinney, of California, in which he suggests that these forest-reservations should be at once utilized as schools. It is his opinion that, while we cannot follow the admirable French system of organization, we might devise something which combines the features of the systems used in France and in the Indian Empire; since a military or half-military plan would give a basis for discipline, would permit the temporary use of the army as guardians, and would make the service more attractive. On this last point Mr. Kinney makes the following very interesting statements:

"Lieutenant Wood, in command of the Yosemite Guard, is very enthusiastic over the effects of the patrol work on his men and horses. He says that the work makes better soldiers and better men of his command, and that men and animals are infinitely better prepared for any real military work than they could be by any garrison duty. He speaks also of the greatly improved moral tone of the men."

It has always been our judgment that the best thing which could happen to the forests on the national domain, after withdrawing them from sale and entry until proper legislation could be had for their management, would be to place them at once in the charge of the army. From another view of the situation, it would seem that the carrying out of this project would also be the best thing which could happen to the army.

The Elms of the St. Lawrence Valley.

GEOGRAPHICALLY, a considerable portion of northern New York and Vermont belongs with Canada; at least it is in the valley of the St. Lawrence. Indeed, the basin of the St. Lawrence includes the entire Champlain Valley, ascending southward almost to the Massachusetts line; while in what is known locally as the "Y" of the Green Mountains (a tract enclosed on the south by the main range and an eastern branch of it which diverges toward the north-east and reaches almost to the Connecticut River), all the streams flow northward, and become, by the way of Lake Memphremagog and the St. Francis, tributaries of the same river, so that a strictly geographical boundary along the southern rim of the St. Lawrence basin would award two-thirds of Vermont to the Dominion. It is noteworthy that, farther east, the northern boundary of New Hampshire and Maine follows the watershed.

It is well known that the geological characters of our portion of the great valley (and, in consequence, its soil) are very different from the rest of New England. Limestones, slates and marbles replace the granitic and gneissoid rocks, and although the marks of the ice age, with its erratic boulders, are everywhere present, the soil itself very closely resembles that of the Ohio River below Cincinnati. As the coral ledges of the Falls of the Ohio, at Louisville, indicate that the ocean, or

a great arm of it, once covered all of the region of the lower Ohio, so the discovery of an entire and perfect skeleton of a white whale near the banks of Lake Champlain, in excavating for the track of the Rutland and Burlington Railroad, indicates that New England and the maritime provinces once constituted a great island, separated from the continent by a strait occupying the Champlain and Hudson valleys.

Soil is a strong factor in determining the arboreal characters of a country, and although there is all the difference due to latitude between the trees of the Hudson and Connecticut valleys and those of their northward extension through the Champlain Valley and the territory embraced by the Green Mountain Y, yet aside from this influence the forest-vegetation continues to be similar, and in marked contrast with that of the granitic soils to the east and south of it, not so much, however, in species (although there is a difference here) as in the vigor and freedom of growth. This is seen in the general aspect of the forests; but since these have been so extensively removed it shows itself more noticeably in the single trees. All down the Champlain Valley to the Canadian frontier, and thence to the bank of the St. Lawrence, we see no diminution in the size and vigorous spread of the Elms, which make so marked a feature of the river-landscapes below. The Elm is one of our "iron-clad" trees, and it develops itself as freely here, on the highlands around Memphremagog, as in lower New England. The picturesque variety of form which the Elm assumes is even more conspicuous, I think, in this region than elsewhere; and often, in accompanying tourist friends in a sail down the lake, I have listened with pleasure to their exclamations at the varied beauty of form and outline against the sky of the long procession of Elms to be seen on the edge of the high land rising from the eastern shore. This is the first step, or bench, referred to by me in a previous article, as a conspicuous feature of the country at this point. At the west shore of Memphremagog the Green Mountain region ends, and, after rising by successive terraces, the land spreads away to the north-east toward the St. Lawrence and upper St. John valleys—one of the finest sections of farming land, and certainly much the largest, in all New England and eastern Canada.

Not so much care has been taken here to preserve the fine large Elms of the original forest as southward, and the comparatively recent settlement of the country has not allowed planted trees time to reach a great size. But there is one of the old settlers remaining, that stands on the main street of the village of Derby Line, and is worth going far to see. I have never been able to get its dimensions, but it is evidently a tree of the original forest, quite straight and branchless for half its height, which can hardly be less than eighty feet, with a diameter, at a guess, that must be five or six feet, with very little tapering in the first half of its length. The great usefulness of Elm timber to the early settlers, for the construction of carts, implements, etc., has caused the older growth to be closely culled of all the straighter trunks, and such trees are comparatively rare. But no tree is more perfectly at home here, and none grows more rapidly from the seed. Although our people are not yet much given to setting out road-side trees, yet the readiness with which the Elm springs up in the shelter of the road-side fences is such that it is the most common natural growth in such positions; and now that our fence laws allow the removal of these fences, the appearance, save for an irregularity of distance, has much the effect of a planted avenue on all of our older highways. Trees that have in this way grown up in my own fences within twenty-five years are eight and ten inches in diameter. The peculiarity of the Elm to assume a great variety of forms is especially seen in these seedling growths, where they have not been crowded. The vase, or wine-glass, the pen or feather, the weeping, the columnar, the spreading and various other more or less eccentric developments are seen abundantly; in fact, there is no tree that presents so many varying aspects as the Elm, and for that reason it may be used alone for avenues with far less monotony of effect than any other tree.

While our White Elms have such a variety of forms, I have not noticed here any examples of the Cork Elm (*Ulmus racemosa*), which is comparatively abundant in the Champlain valley and westward; but the Slippery Elm (*U. fulva*) is quite plenty, and though it never becomes a large tree it grows more rapidly even than the White Elm while young, and will thrive well in a drier soil. Trees of this species always attract the notice of observing persons by their darker, thicker and rougher foliage, and in the spring by their large, dark brown buds. It is quite as hardy against climate as the White Elm, and the foliage is less attacked by insects.

Newport, Vt.

T. H. Hoskins.

Notes of a Summer Journey in Europe.—VIII.

AN excursion to the famous nurseries of L. Späth, at Rixdorf, a few miles out of Berlin, is expected of every one who visits the German capital with any interest in horticulture, or more particularly in arboriculture. Visitors are numerous, and are always welcomed and shown the resources of the place, which covers so much ground that only a superficial inspection of it can be made in a day. My own visit here was much too short to enable me to obtain a proper conception of its resources. It is one of the largest nurseries in Germany, if not in Europe, covering about 600 acres devoted to the propagation of forest, ornamental and fruit trees and shrubs, while a great business is also done in herbaceous and bulbous plants. Lilies-of-the-valley are raised in enormous quantities for forcing purposes. A walk among the large blocks of vigorous plants of Späth's Golden-leaved Dogwood and other variegated plants, purple and variegated-leaved Maples, and thousands and tens of thousands of other plants, either in their natural state or with some abnormal peculiarity, gives one something of the feeling that this is a great plant factory instead of an ordinary nursery. Plants are turned out in such quantities that one may fancy they are made by machinery instead of brought up by hand in the old-fashioned way. The propagation of variations of trees and shrubs seems to be a great feature here, and perhaps more is made of slight differences than is necessary for the advancement and welfare of horticulture. This, however, is a common fault among nurserymen, and in some cases the distribution of such plants may be a necessary stepping-stone to the really distinct things which are occasionally brought out. Too often, also, the variations propagated are the merest monstrosities or the result of disease. The enumeration of so many forms swells the lists enormously, so that it is hardly surprising when we are told that Herr Späth's nurseries contain over 6,000 species and varieties of trees and shrubs, besides nearly 1,000 varieties of Roses and 700 or 800 of fruits. It is said that nearly three million ornamental and fruit trees are always ready for the yearly sales. Grafting is much resorted to as a means of increasing the stock of some things, and tens of thousands of conifers are treated in this way.

As it is impossible to show all visitors over such a large establishment, a small collection or arboretum of the most striking plants has been formed near the principal offices, so that much time may be saved by those who only desire to see specimen plants of kinds they wish to procure. This collection is arranged in groups according to genera, and although there is not room for the trees to develop into large specimens, a fair idea of their habit and general appearance may be obtained. They are all neatly and distinctly labeled with permanent porcelain labels.

Very different from the great commercial nursery or plant factory of Herr Späth are the private nursery and garden and the beautiful country home of Baron von St. Paul at Fischbach, at the foot of the Giant Mountains, in Prussian Silesia, where two days were delightfully spent. Baron St. Paul is another enthusiast in horticulture and arboriculture, never resting or being satisfied with his collection so long as he hears of something which may prove better than anything he already possesses. His garden is famous throughout all the surrounding country, and the road-sides and little gardens in the neighborhood give abundant proof of his influence by the unusual plants or flowers which are seen. The situation is a most beautiful one, in a country mostly divided into large estates, yet like one great park, stretching away in meadows, fields of thriving crops and areas of woodland and forest. Behind the house is the great rock known as the "Falkenstein," while before it lies a series of gradually rising hills terminating in the "Schneekoppe," the highest point in the range, which separates Prussian Silesia from Bohemia.

Fischbach is situated about 1,200 feet above the sea, and in winter the temperature sometimes falls as low as ten degrees below zero of Fahrenheit, while the summers are probably cooler than the average summer of New England away from the mountains. As the conditions and climate more nearly corresponded to what I have nearly always been accustomed, and more than any place I had yet visited, I was particularly interested in the variety and condition of the trees and shrubs grown here. Baron St. Paul's grounds are filled with the best hardy trees, shrubs and other plants procurable, and their whole arrangement shows remarkable taste and appreciation of natural beauty as well as an intimate knowledge of the character of the plants he has to deal with. By joining with Max Leichtlin and others in sending collectors to new or little-known botanical territory, some interesting and valuable rarities have been secured, so that, besides the ligneous plants, we

find here Anemones, Irises, Primulas, etc., as yet little known in the horticultural world. These are often planted in quantity in grass or meadow, or by the side of water if such situation suits them best.

One of the first familiar objects seen on entering the grounds was large masses of our wild *Rosa lucida*, which, although so late in the season (August 9th), was still blossoming well. Although it grows luxuriantly and flowers abundantly, it does not fruit very freely here. *R. Carolina* was just coming into good bloom. Both the purple and white flowering varieties of *R. rugosa* are much and well used, and it is deservedly considered one of the finest of all hardy natural shrubs. I was shown a hybrid between this Rose and *Gloire de Dijon*, which has semi-double flowers of a beautiful blush color. It was interesting to find here a vigorous plant, five or six feet high by as much across, of the single flowered Japanese *Viburnum tomentosum*, recently figured in GARDEN AND FOREST (vol. iv., pp. 594, 595). It was still bearing a few stray blooms. The "Snowball" form, known as *V. plicatum*, now frequently seen in American gardens, is considered rather rare in Germany. Among numerous familiar New England plants I noted the little Bear Oak (*Quercus ilicifolia*) in full fruit, and *Magnolia glauca* in a thriving condition and still flowering. The *Cucumber-tree* (*M. acuminata*) is hardy enough, but some difficulty is experienced with the *Umbrella Magnolia* (*M. tripetala*), as it is liable to be more or less killed every winter. The same trouble is often experienced in New England, and it is often only by repeated trials and much patience that decent specimens may be obtained. At the north it does best where the soil is not too rich or very moist. The European Walnut is barely more hardy than it generally proves in the vicinity of Boston, still it lives in an unsatisfactory way. The Chestnut grows fairly well, but does not fully mature its fruit in this locality.

Many of our American conifers flourish here, among them *Chamaecyparis Lawsoniana* and *C. Nutkaensis*, and *Abies nobilis*. The form of *Tsuga Pattoniana*, known in gardens as *T. Hookeriana*, is much prized here and elsewhere in Germany for the fine blue color of its foliage. While Jeffrey's Pine refuses to grow well, our common White Pine reaches perfect development.

The European Larch here is sometimes seriously injured, and even killed, by case-bearing larvæ of a little moth (*Coleophora laricella*), which eats out all of the interior of the leaves, leaving only the dry, white and shriveled epidermis; but it is a curious fact that the Japanese Larch (*L. leptolepis*) has not yet been affected by the pest. The insect has been introduced and known in Massachusetts for a number of years, and its ravages are sometimes quite noticeable. At the Arnold Arboretum this pest, probably imported with Larches, and the destructive Larch saw-fly (*Nematus Erichsonii*) have been observed and noted for several seasons, and although both have been very abundant I have never known them to affect the Japanese Larch. While it is hardly probable that this immunity can be lasting, it is interesting to know that these insects should have so far avoided this tree. My host informed me that for killing insects on Orchids and other plants he found plunging them into hot water heated to forty degrees Centigrade very effective, and it apparently caused no injury to the plants.

It was interesting to find American varieties of fruits undergoing trial here, and to see our northern Fameuse, or Snow Apple, and others flourishing. Few good peaches ripen in the open air in this part of Germany, but some of our early American varieties, such as Early Alexander and Early Beatrice, do mature. Although fairly good, these American peaches are not considered nearly so richly flavored as the later-ripening French varieties.

The road-sides in this region are often finely shaded by handsome specimens of the native Linden (*Tilia ulmifolia*) and the Ash (*Fraxinus excelsior*). The European Mountain Ash, or Rowan-tree, is also planted along road-sides, but it does not grow so large as it does in the mountains. What is called an edible fruited form of this tree has been found in the mountains of Bohemia, on the other side of the Giant Mountains, and it is now propagated and planted to a considerable extent.

The forests of the mountains here are chiefly composed of Spruce and Fir, and the planting of young woods of these trees is chiefly done in August and September. Large reserves are maintained as hunting-parks, and on these the forests are never entirely cut off, but are thinned out gradually or have small sections cleared in the interior, so that the park-like and woodland effect of the landscape is not marred. Between the Giant Mountains and Görlitz there is some fine farming country,

where steam-plows, steam-threshers, etc., are sometimes employed; but in the low land between Görlitz and Berlin large tracts of the country are sandy and infertile, and here Scotch Pines have been planted on soil where little else but Lichens seem to be able to get a foothold. Some stretches are covered with Heath (principally *Calluna vulgaris*), and the young Pine-trees are set in the midst of it. The planting of these Pines is chiefly done in the spring; they grow slowly on such poor soil, and do not get to be of very large size.

Arnold Arboretum.

J. G. Jack.

The Swan's-neck Orchids.

THERE is a very remarkable American genus of plants known as *Cycnoches*, or Swan's-neck Orchids, which occupies a kind of sporadic or transitory position in our collections, though its species possess a quaint kind of beauty which is peculiarly their own, and none are more interesting to the naturalist. Like *Catasetum*, it has the peculiar habit of producing two very different kinds of flowers on the same plant, and these have a trick of appearing in the most unexpected and extraordinary fashion. Sometimes a plant whose behavior has been of the most orthodox character will suddenly produce flowers of a totally novel kind, in some respects almost as different as are those of *Cattleya* and *Odontoglossum* from each other. Occasionally the two kinds will be borne in different racemes on opposite sides of the same pseudo-bulb, and more rarely they will even appear intermixed on the same raceme. For many years the significance of these phenomena remained a complete mystery, and the early history of the genus is a mass of confusion. For some time I have been trying to unravel the tangled history of the genus, and only quite recently have I succeeded in getting to the bottom of the matter so far as existing material is concerned. And now I am anxious to obtain such further materials as will enable me to complete a monograph of this most interesting group.

The genus was originally described by Dr. Lindley, from a single flower; and the generic name is in allusion to the long slender curved column, which very closely resembles the neck of a swan, though this character is only exhibited by one of the two kinds of flowers.

No sooner had this original species become established in cultivation than it began to exhibit those peculiar propensities for which the genus soon became famous, as will be seen from the following extract from the *Botanical Register* for August, 1837: "In August, 1835," writes Lindley, in a note under t. 1,947a, "Mr. Willmer, of Oldfield, near Birmingham, sent me a specimen of a *Cycnoches*, which had broad petals, a short column, hooded and dilated at the apex, and a broad roundish lip, gibbous at the base, and with its stalk much shorter than the column. It was, however, destitute of scent, while *Cycnoches Loddigesii* has, as is well known, a delicious odour of vanilla. I had no doubt of its being a distinct species, and called it *C. cucullatum*. But in the autumn of 1836, in the garden of the Horticultural Society, a plant of *Cycnoches* produced from the opposite sides of the same stem two racemes; those of the one raceme were the well-known fragrant flowers of *Cycnoches Loddigesii*, and of the other the scentless flowers of the new *C. cucullatum*."

A few years later a still more remarkable case appeared, as is recorded by Bateman at t. 40 of his splendid work, *The Orchidaceæ of Mexico and Guatemala*, in 1843: "Strange things," he writes, "and no less strange than true, have already been recorded of Orchidaceous plants, but the case which is represented in the accompanying plate casts into the shade all former frolics of this Protean tribe. The facts are briefly as follows: Among Mr. Skinner's earliest Guatemala collections, attention was particularly directed to the specimens of a plant which to the habit of a *Cycnoches* joined the long, pendulous stems of a *Gongora*, and for the possession of which, in a living state, no small anxiety was entertained. Some plants were speedily transmitted by Mr. Skinner, but these on flowering proved to be merely the old *C. ventricosum*. A mistake was of course suspected, and Mr. Skinner, being again applied to, sent over a fresh supply of plants, for the authenticity of which he vouched; but these were scarcely settled in the stove when flowers of *C. ventricosum* were again produced. Mr. Skinner being importuned for the third time, and being then on the point of returning to this country, determined to take one of the plants under his special protection during the voyage, which, flowering on the passage, seemed to preclude the possibility of further confusion or disappointment. The specimens produced at sea were exhibited, and the plant itself placed in the stove at Knypersley, where it commenced growing with the utmost vigour. The season of flowering soon arrived, but brought with it a recurrence of the former scene

of astonishment and vexation, for the blossoms, instead of those of the coveted novelty, were not distinguishable from the old *C. ventricosum*. These were still hanging to the stem, when the inexplicable plant sent forth a spike of a totally different character, and which was, in fact, precisely similar to the specimens gathered in Guatemala, and to those produced on the voyage.

No solution, however, of these mysterious phenomena was arrived at, except that they were what gardeners call "sports," and Lindley indulged in some rather wild speculations about the species being masquerading under false faces. But we now know that the species are sexually dimorphic, and that the phenomena observed were simply the production of the two kinds of flowers on the same individual. And this has furnished the clue to a very curious error committed by the artist who drew Bateman's plate. Instead of showing the female flowers of *C. Egertonianum* he has introduced the males of *C. ventricosum*, probably because the former were too much withered to be restored, and moreover the two were so much alike that they were actually thought identical. It is highly curious that the female of one species should be so much more like the male of another species than like its own, yet such is the case, and the plate in question exhibits the peculiar phenomenon of the males of different species growing on the same pseudo-bulb. Probably the artist acted on instructions, for the female of *C. Egertonianum* had been thrice mistaken for *C. ventricosum*. The female of the latter species was then unknown.

This great diversity between the sexes, however, does not extend to all the species of the genus, for in the case of *C. chlorochilon*, perhaps the best-known species in gardens at the present time, the differences between the male and female flowers are confined to the sexual organs—that is to the ovary and column—as the sepals, petals and lip are quite identical in each. This fact is very curious. Although the species has been known for upward of half a century, and has been largely cultivated, the female flowers do not appear to have been observed before the summer of 1891, when they appeared both with M. Lehaie, in Belgium, and with Messrs. F. Sander & Co., in England. It is just conceivable that they may have appeared before and not been noticed, owing to their similarity to the males, though no existing figure of the plant and no dried specimen that I have come across shows them. However, their occurrence was a matter of considerable interest, for it led to the clearing up of the confusion into which the history of the genus had fallen. It is now evident that the genus contains two distinct sections, one in which the sepals, petals and lip are practically identical in the two sexes, and the other in which they are quite dissimilar. In both, however, they are borne in separate flowers. In the females the ovary is normally developed and very stout, and the column short and stout, with a pair of fleshy, triangular wings, and the stigma perfect, but without the anther. In the males, on the contrary, the ovary is reduced to the pedicel of the flower and much thinner, while the column is long and slender, without the wings or stigma, but with the anther and pollinia normally developed. Thus the term swan's-neck only applies to the column of the male flower.

The section *Eucycnoches* (which contains the original species of the genus), in which the two sexes are nearly alike, comprises the following six species:

1. *C. chlorochilon*. Flowers very large, perianth similar and equal in the two sexes, bright yellowish green, the lip yellowish white, with a prominent dark green crest near its base. Racemes few-flowered. Native of Guiana and Venezuela.
2. *C. ventricosum*. Male racemes longer, and with more numerous and smaller flowers than the preceding, and the lip cream-white. Female flowers fewer, rather larger and more fleshy than the males. Native of Guatemala. This is said to have been seen to sport into *C. Egertonianum*, an error which arose from the females of that species having been confounded with the males of the present one.
3. *C. Lehmanni*. An Ecuadorean species, closely allied to *C. ventricosum*. The male flowers are yellow with a green callus; the females are unknown. It is not in cultivation, and I only know it by description.
4. *C. Loddigesii*. Male racemes about 4–6-flowered; sepals and petals brownish green, the former with darker spots; lip whitish, spotted with blood-red near the base. Female flowers fewer, rather larger, and more fleshy. Native of Surinam.
5. *C. Haagei*. Male racemes long, pendulous, and bearing numerous medium-sized flowers, much like those of the following species. Females unknown. I only know the species by description. Native of Brazil.
6. *C. versicolor*. Near the preceding, but apparently distinct. The sepals and petals of the male are of a very peculiar

dull, velvety olive-green, and the lip yellowish white with a few reddish brown spots. Native of Brazil.

The section *Heteranthœ*, so-called because of the great diversity between the flowers of the two sexes, comprises about nine known species as follows:

7. *C. Egertonium*. Female flowers dull olive-green, in shape

radiating clavate fleshy appendages. The segments are purple-brown, or blotched with that color on a green ground. Native of South Mexico and Central America. This is said to sport into *C. ventricosum*, an error which arose from the females of *C. Egertonium* having been wrongly identified with that species.



Fig. 15.—*Symplocos cratægoides*.—See page 90.

like those of the previous section, solitary or borne in pairs on a short suberect raceme. Males much smaller, more membranous, and borne in long, pendulous racemes. The lip is reduced to a small, round disk, surrounded by a number of

8. *C. Dianœ*. A Central American species, closely allied to the preceding, of which the males only are known. They are crimson spotted with brown, and a white lip. It is only known from dried specimens.

9. *C. Rossianum*. Closely allied to the two preceding. Female flowers dark green. Males blotched with purple-brown on a green ground, and borne in very lax racemes. Native country not known, but probably Central America. Only known in cultivation.

10. *C. glanduliferum*. Male flowers light green, spotted with brown, lip white. Females unknown. Native of Mexico.

11. *C. peruvianum*. A Peruvian species, closely resembling the last. Male flowers only known.

12. *C. Warscewiczii*. Flowers of both sexes wholly green; in other respects resembling the preceding species of this section. Native of Central America.

13. *C. aureum*. A handsome Central American species. The male flowers are large, bright yellow, and borne in pendulous racemes. The females are unknown. It appears to have been lost to cultivation.

14. *C. maculatum*. Male flowers large and borne in long, dense racemes, green spotted with brown. Females unknown. Native of Venezuela.

15. *C. pentadactylon*. Male flowers larger than in any of the preceding, and borne in short, few-flowered racemes; yellowish green, barred and blotched with dark brown. Teeth of the lip reduced to five. Females a third larger than the males and far more fleshy, with similar colors, but the spots are chiefly concentrated toward the base of the segments. Native of Brazil.

Kew.

R. A. Rolfe.

New or Little-known Plants.

Symplocos cratægoides.

SO much interest has been awakened among the lovers of hardy shrubs by the notes that have appeared from time to time in these columns on the merits of this plant as an ornament of the garden and the shrubbery, that, at the request of some of our readers, we have had prepared for their benefit the portrait which appears on page 89 of this issue, from one of the plants in the Arnold Arboretum. There is little to be added to what has already been said of this plant. It is a hardy tree-like shrub, which will doubtless grow in time to a height of ten or twelve feet, and perhaps even to a greater size. The flowers, which resemble those of the Hawthorn, although they are rather smaller than the flowers of the Hawthorns of the northern states and of Europe, are produced in the greatest profusion during the month of May. In the autumn the branches are covered with clusters of small fruit of the most beautiful and brilliant ultramarine blue. The color of the fruit is the most remarkable characteristic of this plant, and it is this that makes it such a valuable garden-plant.

Symplocos cratægoides is distributed from Japan to northern India, and, as is natural in the case of a plant that inhabits an area of such diversified climates, it assumes very different forms of foliage and of habit, and botanists have at different times bestowed upon it a number of different names. It is to Mr. Thomas Hogg, one of the earliest American travelers in Japan, and one of the most successful introducers of Japanese plants, that our gardens owe this beautiful shrub, which deserves all the attention it has received during the last two or three years, and which must rank among the very best hardy plants in cultivation. The plant was sent to the Arboretum several years ago by the Messrs. Parsons, of Flushing, Long Island.

Clematis paniculata.

THIS plant has already been figured in GARDEN AND FOREST (vol. iii., p. 621), and attention has often been invited to its singular value as an ornamental climber. It is surprising that such a handsome plant, which was introduced into Europe nearly a hundred years ago, should have remained so long practically unknown. The happy thought of Mr. Orpet to graft it on our common wild species, *C. Virginica*, and afterward upon *C. stans*, showed how easily it could be propagated, so that everybody now has an opportunity of testing its merits. The plant from which the illustration on page 91 was made is trained on the western side of the residence of Walter Hunnewell, Esq.,

Wellesley, Massachusetts. It was raised from seed, and is now four years old, and has bloomed for two years. Last season it covered about a hundred square feet, but because the space it could occupy was limited it had been pruned back severely, or it would have otherwise spread over twice as large an area. The photograph of which this illustration is a reproduction was taken on the 12th of September, and the plant in the latitude of Boston begins to bloom about the 20th of August, when most other species of *Clematis* are covered with seed.

Mr. T. D. Hatfield, who sends us the photograph, states that the stems of the plant are left on the trellis, and are quite unprotected. Some of his plants have a north-western exposure, but they have endured the winters of four years without the slightest injury, the wood keeping sound and breaking to the top. Under such treatment the lower parts of the stems sometimes are bare, so that it is advisable to cut them back to encourage the growth of new wood.

Prunus hortulana.

THE hardest puzzle in American pomology is the classification and nomenclature of the native cultivated Plums. Something over 150 varieties are known to cultivation, and these are commonly referred, loosely, to two species, *Prunus Americana* and *P. angustifolia* (*P. Chicasa*). But the varieties represent at least two other species, and perhaps even more. One of these species, which appears to have escaped botanical recognition, includes a large class of Plums represented by Golden Beauty, Cumberland, Garfield, Sucker State, Honey Drop, probably Wild Goose, and others. The species appears to grow wild over a large part of our interior region from Kentucky and Illinois to Texas. It is readily distinguished from our other species by its long ovate-lanceolate and acuminate leaves, which have finely and evenly serrated edges, by long and glandular petioles, and by glandular and more or less pubescent calyx-lobes. The fruits are red or yellow with thin skins and more or less translucent flesh, a very thin bloom, and a juicy sweet flavor. The fruits are later than the Chickasaws, to which these plums have been mostly referred for many years. For this species, which I shall describe more fully on another occasion, I propose the name *Prunus hortulana*.

Cornell University.

L. H. Bailey.

Cultural Department.

The Adulteration of Copper Mixtures.

AT the late meeting of the Western New York Horticultural Society, Dr. Van Slyke, chemist of the Experiment Station at Geneva, read an interesting paper giving an analysis of some of the substances used in spraying plants. The substances analyzed were copper sulphate, commonly called blue vitriol; copper carbonate and copperdine, a special preparation, said to be a mixture of copper carbonate and ammonium carbonate, in the proportions recommended by the Department of Agriculture. Without going through the details of the analysis, we give the summary of the conclusions reached, which are of practical importance, since the copper mixtures are so largely employed against the fungous diseases of cultivated plants.

Copper sulphate, in the form of large crystals, may be regarded as being fairly pure, but when in the form of powder it is always safe to test its purity. Copper carbonate, on account of its rather high price, and also on account of its powdered condition, is probably quite liable to adulteration, and should always be tested. Copperdine, in the dry form, costs twice as much as it ought to, but contains the official proportion of copper. Copperdine, in liquid form, costs three or four times as much as it ought to, and, as regards the proportions in which its use is recommended, it is only one-half or one-third as strong as it should be.

While the help of a chemist is needed to tell how much copper a substance contains, the following suggestions will enable

any one to test copper sulphate and copper carbonate as well as Paris green in regard to their purity:

Copper sulphate, if pure, should dissolve completely in water, making a clear solution, free from sediment or suspended matter.

Copper carbonate should dissolve completely in nitric acid, commonly called aqua fortis. If it does not dissolve completely, it is impure and probably adulterated. Copper carbonate, if pure, should dissolve completely, or very nearly so, in a considerable quantity of strong ammonia-water. Both tests should be used. Of course, copper carbonate could be adulterated by using powdered copper sulphate, but this could easily be detected, since copper sulphate easily dissolves in water, while copper carbonate does not.

Paris green should, if pure, dissolve completely in strong ammonia-water, used in liberal quantity.

Such simple tests as the foregoing may be applied by any one, and they will serve as a fairly reliable guide regarding the purity of the compounds mentioned. When adulterants are added they have been found by common experience to exist in the form of some finely powdered white substance, as

in appearance there may be seen the dark fruiting spots of the fungus, where the spores are borne in large numbers. This form of damping-off is particularly contagious, on account of the rapidity with which the spores germinate. By actual test cases of inoculation, fully developed spore-bearing spots have been produced upon healthy Carnation-stems in three days when these stems were kept moist, as are the portions of cuttings below and at the surface of the sand. Gardeners have frequently observed that some stock is much worse than others with this cutting-trouble, which, in large part, can be accounted for on the ground that the fungus is not uniformly distributed in mature plants. Stock free from it will be apt to remain free, but diseased stock, in like manner, is quite sure to decay in the sand.

The failure of Rose-cuttings to grow may be due, of course, to various causes, but the one that has been most frequently met with of late is fungus belonging to the genus *Gloeosporium*. This fungus forms minute pimples in the bark of the diseased wood, followed by an exudation of a gelatinous spore-mass from each pustule that is, at first, rose-tinted, becoming almost brick-colored. The branches of many Rose-plants in



Fig. 16.—*Clematis paniculata*.—See page 90.

barium sulphate, for example, which is insoluble in water, alkalis or acids.

Fruit-growers who have to use large quantities of copper compounds should, for the sake of economy, buy the separate ingredients and do their own mixing. Persons who have occasion to use only small amounts of spraying mixtures may find it advantageous to purchase prepared compounds ready for use, if they can be sure that the preparation is reliable in strength and not extravagantly high in price.

Fungus Troubles in the Cutting Beds.

DURING the past few weeks particular attention has been paid to some diseases in the cutting beds. Among those found dead or badly decayed are cuttings of Carnation, Rose, Clematis, Passion Flower and Chrysanthemum. In the Carnations, for example, the cuttings begin to decay at the surface of the sand, the outer leaves soon rot at the base and fall to the ground. This is due to an anthracnose of the genus *Colletotrichum*, and long before the cutting has become ruined

a feeble condition have been examined microscopically, and this fungus has been detected. While we have not found it naturally upon the foliage there was no difficulty in inoculating leaves with the *Gloeosporium*, by placing them in contact with diseased stems in a moist chamber. Rose-wood that is only slightly diseased with this anthracnose when made into cuttings would probably fail, because the new conditions would be particularly favorable for the growth of the fungus. As in the case of the Carnations, the obvious precaution is to use healthy wood.

Many Chrysanthemum-cuttings have failed, and an examination of a considerable number of these leads to the identification of at least two fungi, either one of which is sufficient to account for the trouble. During the past year Chrysanthemums have suffered a good deal from the presence of a fungus of the genus *Septoria*, which caused the severe blighting of the foliage in some instances, almost defoliating the plants. This same *Septoria* is present in abundance in the cuttings that have damped off. Other plants, obtained from other greenhouses, and appearing in the same plight, have a *Phyllostiata*

as the destroying fungus. The differences between these need not concern the practical grower.

The wholesale loss of cuttings of Abutilons in some propagating-houses is also to be traced to diseased wood and to a fungus that is similar to, if not identical with, the *Colletotrichum* of the Carnation. Experiments were made in growing cuttings of the Abutilons of several varieties and inoculating them with the fungus. In a few cases the transfer was successfully made, and there seems but little doubt that the dying of the cuttings of even such woody plants as the Abutilon may be due to germs which pass from one plant to another.

Nasturtiums, in the same way, are frequently attacked by a *Colletotrichum*, and when cuttings are made of plants thus diseased they damp off and because of the succulent nature of the cuttings, they almost entirely disappear. Clematis, Jessamine and Passiflora cuttings behave much like those of the Abutilons, and are attacked by the same or by a similar anthracnose. The inference from it all is to be careful and use healthy wood.

Rutgers College.

Byron D. Halsted.

The Vegetable Garden.

A GREAT many new Beets are continually offered, but, for family use, my own opinion is that the old Extra Early Bassano is as good as any. Some object to its light color; but this is only a fancy, for in quality it is vastly superior to the dark Egyptian. Its big top makes it objectionable to the market-gardener, but as I am writing mainly for amateur gardeners, I would say use the Bassano and Eclipse for early sowing, and sow a few seed a little earlier than you consider safe. Once fairly above the ground, they will stand some frost; but if caught just as they are coming up, they are easily killed. Here we sow the first in February and early March—a month, at least, later for latitude of New York.

Some gardeners sow Salsify and Parsnips very early because of their hardy nature, but I have found that this is an error. The early sowings get into a stunted condition about midsummer, and later on begin to grow again. In this latitude Salsify makes its best crop sown in July, while at the north seeds sown in June will make better roots than those sown earlier. The Sandwich Island Salsify is so much better than the old sort that we use it altogether. If the Cabbage-plants in cold frames are properly hardened off by gradual exposure to the air, they may in this section be set out the middle of February, and in New York and New Jersey in March. This refers to the plants raised under glass in January and February. The fall-sown plants are out long ago here.

While spring-sown Spinach does not amount to much, it can very well be allowed to occupy the land intended for Snap Beans later on. The Beans can be sown between the rows of Spinach, and by the time they need work the Spinach will be over.

Onions sown now in a cold frame and transplanted later on to the open air, we find to make a much heavier crop than if sown and thinned out where they are to grow. The cold frames can now be used also to good advantage in growing early Radishes and Early Horn Carrots. Here, Radish-seed can be sown on a sunny border, and covered with straw when a cold wave threatens.

Raleigh, N. C.

W. F. Massey.

Anemone Japonica.

IN order to have good specimens of this handsome plant for blooming in early autumn it is necessary that they should be potted and placed in a cool house early in March. By so doing nearly a month is gained in the blooming season. They will commence to grow almost at once, and by the middle of May, after a little necessary hardening, can be plunged out-of-doors. This should not be done until all danger of frost is passed, as I have found from experience that the foliage is very easily scorched. Foliage thus disfigured remains on the plants the whole of the season, and spoils their appearance.

We use good rich loam, which is packed quite firmly, leaving more than the ordinary space for water. All the soil is shaken away and the small roots cut off. Nothing but a clump of twelve to fifteen crowns is left, and these are kept about the centre of the pot. If for no other reason than the removal of the young roots, I should repot them every year, as every piece of root is so prolific in the production of young plants that if left unpotted a second year about all we should have would be a forest of suckers or young plants, completely impoverishing the soil.

Abundance of water is needed to produce bold, handsome specimens, and no plant I know, except, perhaps, the Chrysan-

themum, sooner shows the want of it. When the flower-stems appear in July I begin to give manure-water, and continue it weekly until the flowers begin to open. I have often wondered why florists do not grow this plant. All admit its value for cut flowers. It is easy to grow, and no pest or disease, as far as I know, troubles it. All that would be necessary is a cold frame, with a little litter at the sides and mats and shutters for covering. They could be planted in ordinary loam about six inches apart, and one foot from the glass. All the attention required during winter would be occasional airings on bright days. After the 1st of March they should be opened regularly and the sun heat stored, whenever possible, by closing early in the afternoon until they are well started into growth. Gradually, and whenever the weather permits it, the sashes may be removed, and when danger of frost is over altogether, plenty of water and good feeding should be given until the flower-buds begin to open, and then a slight structure ought to be erected, so that a light waterproof covering of oiled cotton cloth could be stretched over merely to prevent rain spoiling the flowers.

There are several varieties, but two only can be recommended for trade or private purposes. These are the white variety, known as Alba, and sometimes called Honorine Joubert, and the pink one, known as Hybrida, which resembles the white variety in everything except the color of flowers.

Wellesley, Mass.

T. D. H.

Solandra grandiflora.

ALTHOUGH introduced more than a hundred years ago, this plant is still rare; so rare, indeed, that I have never seen it grown anywhere outside of botanical gardens. This is not due to any lack of good qualities on the part of the plant, nor to any real difficulty about its cultivation, but rather to the erroneous impressions that it is difficult to manage.

The genus *Solandra* differs considerably in general appearance and some important characters from the typical genus of the Solanaceæ. It was founded by Swartz in honor of Dr. Solander, and *S. grandiflora* is undoubtedly the best of the four or five species. It is a semi-scandent shrub of free growth and handsome appearance. The bright green shining leaves are deciduous, oblong, tapering both ways, at the base to a short petiole. The large funnel-like flowers, about seven inches in length by some five inches in width, are usually borne singly at the extremity of the young branches, and they remain upon the plant from four to six days after full development, the corolla being still perfect when it drops. The calyx is green, and when the flowers first expand the corolla is of a very pale green color, almost white in the locality of the lobes, changing gradually to a beautiful deep buff tint. It is not uncommon for as many as three flower-buds to appear on the extremity of a single shoot, but it is quite exceptional for more than two of them to survive the bud-stage.

A plant of this species flowers freely every winter in the Palm-house of the Harvard Botanic Garden, and at that time it is to the casual visitor a never-failing source of such wonder and admiration as is excited by a first glimpse of the *Victoria regia* in bloom. This specimen is grown in a pot of rather poor loamy soil, and the roots are never molested except to receive a slight top-dressing of similar material every autumn. Some of the roots have escaped from the bottom of the pot and seem to revel in the sandy gravel of the bench. The branches are trained close to the glass, where they enjoy full exposure to sunshine all the year round, and the night temperature of the house seldom exceeds sixty degrees Fahrenheit in winter. Little or no water is given the plant from the fall of the leaf onward until growth commences again in early autumn, from which time the supply is unstinted, necessitating ample drainage. *S. grandifolia* inhabits rocky situations in Jamaica; and cuttings of the half-matured wood root readily in sandy soil with the aid of a little bottom-heat.

Cambridge, Mass.

M. Barker.

The Kaffir Lily, botanically known as *Schizostylis coccinea*, is a beautiful plant of the Iris family, and the only one of its genus known in gardens. It is said to occur on the shores of rivers in Kaffirland, South Africa, whence it was introduced in 1863 by the Messrs. Backhouse, of York, England. The erect stems proceed from spreading roots, best described as half bulb and half rhizome, and are about two feet in height. They are furnished with long, sheathing, bright green, sword-shaped leaves, which lessen in size and number as the length of the stem increases, and terminate in a spicate, *Gladiolus*-like inflorescence. The narrow tube of the flower is greenish and about an inch in length, the regular, spreading, six-lobed limb two and a half inches in diameter, and of bright crimson-scar-

let color. On plants that have made good growth the flowers are produced with great freedom during the winter months, and they are excellent for cutting at that season, and last well in water. The Kaffir Lily may be grown in the open garden during the summer in a somewhat moist situation and rich soil and wintered in a sunny cold frame. But unless it is grown simply to supply cut flowers much of its usefulness as a decorative plant is lost by confining it to a frame, and therefore it is better if potted when taken up in autumn and placed in a cool greenhouse, where it should have plenty of moisture and occasional applications of weak liquid manure to the roots. Under such conditions it will help materially to brighten the house through the greater part of the season, besides being handy for cutting if necessary. It is easily propagated by dividing the roots late in spring. When cultivated in a greenhouse, and the flowers allowed to fade upon the plant, the seeds ripen freely in our climate, and these, when obtainable, afford the best means of increasing the stock. They should be sown in slight heat under glass, and picked off and transplanted in the open garden when about six inches high, taking care that the change of temperature is not too abrupt. In this way nice plants may be obtained in one year from the time the seeds are sown.

Cambridge, Mass.

M. Barker.

Correspondence.

In the Shore Towns of Massachusetts.—VII.

To the Editor of GARDEN AND FOREST :

Sir,—While my principal errand in the shore towns was to find out what open spaces for public resort have already been provided, I also tried to learn as much as possible of the industries and resources of the people, of their thought and public spirit, of the local history, and whatever might tend to promote the objects of the Trustees of Public Reservations. I found everywhere recent changes in the ownership of land and a movement of people of means from the cities and the interior of the country to the shore regions of the state. I found leagues and leagues together of the shore-line all private holdings, without a rood of space in these long reaches to which the public has a right to go. I walked across the domain of one man who owns about six miles of shore-line. I found a great population inland hedged away from the beach, and all conditions pointing to a time, not remote, when nobody can walk by the ocean in Massachusetts without payment of a fee, as we formerly had to pay for a glimpse of Niagara. I could see that the movement for open spaces for public resort has vital relations to civilization, and has been instituted in response to a pressing need. I note some of the impressions which were oftenest repeated and most distinct.

1. Except in a few instances, the public holdings in these towns have not been measured, and their area is unknown. It would be well to have them accurately surveyed, the bounds marked and their area made a matter of public and authoritative record.

2. In a large proportion of the shore towns the public holdings have diminished in extent. Not only have all the old common lands, town pastures, woodlands and extensive shore holdings been parceled out to private possession, but the towns have permitted serious encroachments upon the smaller public holdings which were intended by the founders to be permanent. It is often evident that the first settlers had a pretty clear idea of the value of open spaces for public use in towns and villages, and they showed much foresight and public spirit in providing for them. But in later times these public holdings became the object of perpetual assault and invasion, and an astonishing amount of energy and ingenuity has been employed in the effort to appropriate public property to private use and possession. It often seems that the same labor in any legitimate industry might have brought prosperity to men who always remained poor, but they appear to have attributed their poverty to the failure of their attempts to seize the last small remnants of the public holdings of their towns. Those who have wished to despoil and appropriate the property of the town have, however, usually found their opportunity and incentive in the indifference of the community regarding public rights and duties, and invaders of the public holdings have gained title by undisturbed occupancy. The man who has wrongfully seized and kept the largest portion of the town lands is often regarded with admiration. "He was too long-headed for the town; he beat 'em at last."

3. In a large proportion of the shore towns there are no open spaces of any kind for public resort. Some inconvenience is already felt on this account, especially in the matter of places

for picnics and out-of-door assemblies of the country people.

4. Wherever the summer people have bought land on the sea-shore they show a disposition to exercise the right of exclusive domain, and to repel as trespassers all who wish to enter upon their grounds, and the people of the region are thus excluded from places where rights of public resort and passage have been exercised for generations. Even where the ancient public rights are clearly legal they are being generally relinquished.

5. The most important feature in the present condition and prospects of the shore towns is the change in the population which is going on everywhere, and the resulting transfer of the title to the land to new holders. There is a general movement of moneyed people from the cities and towns of the whole country east of the Mississippi River to the shore towns of this state. Individuals, companies and associations are buying land everywhere along the shore. Besides what is done openly, some citizen in each town acts as agent for principals who prefer not to be known. Some of these say they are buying for New York men, but capitalists in various interior cities are investing here. It is largely a movement of people able to have fine places for either summer occupancy or permanent residence by the sea. The extent of some of these new holdings on the shore is remarkable and ominous.

6. Except at Salisbury Beach, Plum Island and a few other places there is not yet much foresight of the need of sites for summer cottages to be leased to people of moderate means. Most of the real-estate men prefer to sell their land outright. They do not want the trouble of leasing it or of collecting rents. The hope of a great advance in the price of their land is more attractive to them than a permanent revenue from property requiring supervision and management. Yet even money needs care and oversight, unless it is handed over to the endowment societies or invested in some of the securities with which New England people have made acquaintance during the last few years. At some points on the shore money invested in cottages or sites rented to persons of small income would probably yield a good return.

7. Many farmers and residents in the shore towns have recently sold their land at very low prices, being rather surprised at any actual offer. When it sells at a great advance soon afterward, they feel that "the times are out of joint." When the native farmers sell their land, they ought to have fairly good prices for it. It is not likely that many of them will ever own land again.

8. Many of these men will be obliged to find new occupations, in order to make a living. The industries of the shore towns will be greatly changed by this movement into them of so many people, who seek only residence and recreation. Population of this character does not invite or support manufactures, but distinctly repels them. The old industries—fishing, whaling and ship-building—are nearly extinct, and much depression, anxiety and hardship result from the failure of the accustomed means of obtaining a livelihood. Some young men may find employment as coachmen, gardeners and common laborers for the summer residents, but foreigners from the cities are more likely to fill these places, and such communities do not offer employment to many laborers of any class except cooks and house-servants.

9. It is time to inquire what resources or opportunities will remain for the native people of the shore towns. There is one resource which has received comparatively little attention of late—the soil. The soil of most of the shore towns of Massachusetts appears to me much better than the popular estimate of it. It has greater capabilities than are yet recognized. This is especially true of the Cape Cod country. The soil there is better than that of southern New Jersey, and I have seen many Massachusetts men in Dakota, Montana and Idaho trying, in great privation, to make a living in regions much more forlorn and hopeless than any part of the shore country of the old Bay State. The productive power of the soil should be tested with crops for modern markets. It is not yet known what can be most profitably grown. Asparagus has been tried in Eastham and Orleans with encouraging results, and Turnips grown in other towns are said to distance all competition. The Cranberry industry is still expanding, and fruit-growing and market-gardening can probably be extended almost without limit and yield a good profit on the labor of the owners of the land. I think these towns might yet support a great population by a highly developed agriculture and horticulture, and that the owners of the land might wisely keep it and cultivate it. This would tend to delay the complete absorption and appropriation of the shore regions by summer residents from the cities, and would render the transition to new conditions less sudden

and abrupt than it is likely to be without this modifying effect, and such a postponement of the coming change is in every way desirable. If the farmers and land-owners of the shore towns can adapt themselves to the new conditions of life and make a good living out of their land, they would better hold on to it and stay where they are. But the army of summer incursionists will win in time, and will ultimately "occupy the land," as few American farmers have foresight enough to hold out against the offer of "a good price."

10. For any considerable improvement or development of the resources of these towns two things are indispensable—first, a readier acceptance of the necessity of downright hard work; and, second, a greater flexibility of mind and disposition on the part of many of the native inhabitants, enabling them to recognize the changing conditions of the time, and to take advantage of the opportunities which these changes present.

11. Although this movement and incursion of a new population is going on all around them, many of the native inhabitants are not aware of it. They know that two or three farms near them have been sold and have heard that a land company has bought a stretch of shore in the next town, but they do not put these things together or see their connection with a general movement. They have not observed that there is any movement or tendency in any direction, except that "times have been getting worse for some years now." They "rail at fortune in good set terms," and would rather rail than work. They lament the decay of the old good times, when their town had a fleet of several hundred sail and every man on Cape Cod was the captain of a ship, and they have no perception of the chances which the present time offers to resolute and capable men, and they thus sometimes neglect and reject opportunities of great value.

12. Some of the native people have a feeling of impatience regarding the changed conditions around them. They are depressed and snappish, and so make unfavorable impressions on strangers who are looking for land, or studying the country with a view to a choice of regions for investment. They do not think of the possible effect of civility or its opposite upon their own interests and affairs. One man, who found that he had been rude at the wrong time, remarked, in his astonishment, "I didn't suppose he was lookin' for land. I could a' sold him just the piece he wanted."

13. A wholesome competition in hotel-keeping would be a great benefit to some of the towns. There are some excellent houses which attract summer visitors, and give to all strangers favorable impressions of the country. Others reminded me of the mining-camp lodging-houses in the Rocky Mountain and Coast-range regions, and these hotels exert a potent influence in keeping people away from their neighborhood. I saw a New York man treated very uncivilly by the clerk and the company of hangers-on in the office of one of these houses. As we walked to the railway station next morning he remarked: "Some men are naturally civil; they are born that way; and a man with any sense learns to be civil because business requires it; but some infernal fools won't be civil even when they could make money by it." In another place I was talking with a town officer by the road-side, early in the morning, when some Boston people came along. They had passed the night at the hotel, and, finding it intolerable, had started out to try to find breakfast somewhere else. The ladies of the party were homesick, and wished they could take a train for Boston at once without waiting for anything to eat. The men joked the resident about his town and the hotel. He laughed, but made a gesture of vexation as he replied: "Yes, it's an old story. Everybody complains. Those who go there never want to see the place again. It would pay the town to buy the house and shut it up."

14. All the pleasant and comfortable sites along the seashore of Massachusetts are likely to be taken up, either by summer dwellers or permanent residents, before any general attention is given to the interests involved. The movement toward the shore has only fairly begun, and it is certain to increase with the density of the population of our country and the growth of wealth. Even now along vast reaches of the coast there is no area outside of the narrow highway to which the public has a right to resort to enjoy the sight or air of the sea. These conditions will be intensified, and the people of the state will be excluded from all interesting and attractive portions of the shore. These are abnormal and undesirable conditions, unfavorable to civilization, and all possible wisdom and foresight should be employed in the effort to secure adequate open spaces for public resort at different places along the coast.

15. Two questions constantly present themselves to one observing present conditions and tendencies in the shore towns.

a. Should there not be a broad public road or highway, or strip of public land, along the whole length of the sea-shore of the state? It need not always follow the water's edge, perhaps, but could be carried inland above the worst marshes.

b. Would it not be well to consider the question of limiting the length of the shore-line or ocean front of private holdings? The extent of the shore-line of the state is impassably limited, while the population of the country is certain to increase to an extent which is now almost unimaginable. Is it consistent with the public welfare that a few persons should have absolute possession and control of unlimited areas of the shore? What are the actual benefits which a man derives from the exclusive ownership and occupancy of four or five miles of sea-shore? What are the reasons which justify such a monopoly? The problem of title to the shore, and of the use and enjoyment of it by the people of the state, will in time be a vital and important public question here.

16. The subject of adequate playgrounds is forcing itself upon public attention in some of the shore towns, where the right of peaceable assembly out-of-doors is denied to boys, and they have no right to meet anywhere in the open air for athletic exercises, amusement or self-improvement. Every village and neighborhood should have out-of-door places of resort for the happy play and education of the children and youth of the region.

17. Some methods of acquiring public reservations are already provided by law in Massachusetts. There is, I believe, no general law under which towns may acquire land for the establishment of a system of water-supply. The towns which have done this have acted under separate special acts. But there is an act which enables water boards of towns to condemn land to protect the purity of their water-supply.

18. Chapter 157 of the laws of 1885 enables village improvement associations to improve public grounds or open spaces in any of the streets, highways or townways which the town may designate as not needed for public travel. They may grade, drain or curb such spaces, may set out shade or ornamental trees, lay out flower-plats, erect fences or railings, and otherwise improve such spaces, subject to the authority of the Selectmen or Road Commissioners. Approved April 13, 1885.

19. The Public Domain Act, approved May 25, 1882, authorizes a public domain loan and the taking of land by any town or city for the preservation, reproduction and culture of forest-trees, and for the sake of the wood and timber thereon, or for the preservation of the water-supply of such town or city. The title of all lands taken under this act shall vest in the commonwealth, and shall be held in perpetuity for the benefit of the town or city in which such land is situated. I think no action has ever been taken under the provisions of this law, and it is not likely that it will ever be carried into effect in practice.

20. Under the Park Act, approved April 13, 1882, towns and cities may take land within their limits for parks by vote of two-thirds of the legal voters present and voting in a legal town meeting called for the purpose, or in a city by the vote of two-thirds of each branch of the Council. The act authorizes bonds for a public park loan. Land beyond their own limits cannot be reached by towns or cities under this act. A number of towns have taken action under its provisions.

21. In Chapter 109 of the Laws of 1882 county commissioners are required, on request of ten or more freeholders, to ascertain the correct location of a public landing if it is doubtful or not readily known, to erect necessary bounds, and to make record of their proceedings, as in the case of highways.

22. The act to incorporate the Trustees of Public Reservations, approved April 21, 1891, confers powers which are practically almost unlimited within the scope of the objects for which the board was created. The corporation is authorized to acquire and hold by grant, devise, purchase or otherwise real estate, such as it may deem worthy of preservation for the enjoyment of the public, to the value of a million dollars, and another million of real and personal property to pay for taking care of the first million's worth, and to support or promote the objects of the corporation. The board can apply and use its funds in any way or manner adapted to support or promote these objects. No doubt the limitation as to amount could be extended if necessary, so that the board could receive and hold all that may be offered to it. It was understood at the time of its passage that this act would meet a want already existing, that some persons had property which they wished to transfer to such a corporation to be held for public uses, and that such gifts would be offered at once. The immediate consummation of such purposes would be a useful advertisement of the objects of the board.

23. The newspapers have been most prompt and cordial in their recognition of the undertaking, and their aid has been so intelligent and efficient that the popular knowledge of the enterprise is much more extensive and substantial than we could have expected to produce in so short a time. There is, however, no reason to expect that the objects of the movement can be attained without considerable direct effort to promote and support them. Means will be required for the systematic propagation and diffusion of ideas until the people of the state in general regard the enterprise seriously, and recognize its relations to civilization and the public welfare. If the movement is to be adequately successful much repetition will be necessary in the educational work required to produce a distinct and fruitful impression on the public mind.

24. Most people are so busy that but a limited amount of mental alertness or energy remains available for the objects of this movement. There is always much vague talk about progress, or the capacity for it, but no analysis of the subject has been seriously attempted in this country. I suppose the most that can be said by thoughtful men regarding it is that a narrow zone of improbability runs through the life of the best races. It is broader at some times than others, but it is never very wide. How far it extends, and what capabilities it includes, can be ascertained only by strenuous and intelligently directed effort to occupy and utilize it fully. Few efforts to influence public opinion are adequately directed, and the methods employed for this purpose are usually haphazard and unscientific.

25. I think the trustees should have a library and collect all local histories—of places in the state—and whatever materials for local history may be available in any form. Some of the old town histories are very valuable, and copies are becoming scarce. All town reports should be collected and preserved, and those of certain boards and commissions. The work of the trustees will doubtless produce a general increase of interest in local history—a most wholesome and desirable result. In many of the shore towns the descendants of the oldest families, although educated in the public schools, are almost entirely ignorant of the history of their own towns and of the part their ancestors had in it. Many of the teachers in the schools are no better informed on this subject. The lack of popular interest regarding it is often astonishing. In one of the towns the two hundred and fiftieth anniversary of the organization of the church came and passed without any observance or recognition whatever. There was not even a prayer-meeting, or any allusion to the date in the sermons or services either before or after it. I think that every town should prepare a brief compend, or manual, of the principal facts in its own history, and provide that it shall be studied and taught in the town schools. It would be the natural introduction to state and United States history. Once, at least, each year the schools should visit and examine the most important historic places in the town.

26. The neglect and desecration of many of the old graveyards in the shore towns is a matter for most serious regret. I have not mentioned all the instances that came under my observation. There were too many of them for separate description, and the story became monotonous. It is unaccountable that, in several cases, with vast areas of barren and worthless ground on every side, the citizens should have decided to run a public road directly through the old cemeteries, thus violating the graves of their forefathers and destroying the head-stones, by which alone the resting-places of their dust could be identified. The sites of some of the smaller early burying-places are perhaps irrecoverably lost and indistinguishable, but steps should at once be taken to mark and protect all that remain.

27. It was encouraging to find so many highly civilized men in the office of town clerk, and out of it. My thanks are due to the town officers and citizens in general everywhere.

Boston, Mass.

J. B. Harrison.

Recent Publications.

The Pepino, *Solanum muricatum*.

WITHIN the last few years a novelty has appeared in the seedsmen's catalogues under the name of Pepino, Melon Pear, Melon Shrub and *Solanum guatemalense*. Its botanical affinities and its horticultural merits have been perplexing, and, therefore, Professor Bailey has tested the plant for two seasons at the Cornell Station, and in a late bulletin he gives an interesting account of it, the main points of which are here reproduced:

The plant is a strong-growing herb or half-shrub in this cli-

mate, becoming two or three feet high and as many broad. It has a clean and attractive foliage, composed of long-lanceolate, nearly smooth, very dark green entire leaves. It is a profuse bloomer, the bright blue flowers reminding one of Potato-flowers. But one fruit sets in each flower-cluster, and as this grows the stem elongates until it reaches a length of from four to six inches. The fruit itself is very handsome. As it ripens, it assumes a warm yellow color, which is overlaid with streaks and veins of violet-purple. These fruits are somewhat egg-shaped, conspicuously pointed, and vary from two and a half to three and a half inches in length. If the fruits are still green upon the approach of frost, they may be placed in a cool dry room, where, in the course of two or three weeks, they will take on their handsome color. If carefully handled or wrapped in paper, the fruits will keep until midwinter or later. The fruit is pleasantly scented, and the flavor of it may be compared to that of a juicy, tender and somewhat acid Egg-plant. It is eaten either raw or cooked.

Upon the approach of winter we dig up some of the plants and remove them to the conservatory or forcing-house. It is in the capacity of ornamental plants that they will probably find their greatest usefulness in this latitude. The habit is attractive, the flowers bright and pleasant, and the fruit—if it is obtained—is highly ornamental and curious. The plant will stand a little frost. It has not fruited freely at the station, however, although it blooms profusely, and efforts have been made to insure fruiting by hand-pollination. The anthers give very little pollen. Perhaps half the plants succeed in setting two or three fruits apiece. All the fruits raised have been entirely seedless, although the seed-cavities remain. The plant must be propagated by cuttings or layers therefore. The stock used was obtained from a botanical specimen from Florida and was not thoroughly dried.

This plant was introduced into the United States from Guatemala in 1882 by Gustave Eisen, of California. There has been much speculation as to its nativity and its true botanical position. At first it was thought by some to be a variety of the Egg-plant, but it is very distinct from that species. But the plant is by no means a novelty to science nor even to cultivation, for it was accurately described and figured so early as 1714 by Feuillée in his account of travels in Peru. He called it *Melongena laurifolia*. At that time the plant bore "several little lenticular seeds, one line broad." It was carefully cultivated in gardens, and the Indians ate it with delight. The taste is described as somewhat like a melon. Eating too heartily of it was supposed to bring on fevers. In Lima it is called Pepo. In 1799 it was again described and figured by Ruiz and Pavon. They described the fruit as "ovate, pointed, smooth and shining, white variegated with purple, hanging, of the shape of a lemon." They say that it was much cultivated in Peru, and added that it was propagated by means of cuttings. It was called "Pepino de la tierra." In 1785, Thouin, a noted French gardener, introduced it into Europe, and four years later Aiton, of the Royal Garden at Kew, England, named it *Solanum muricatum*. The specific name, muricate or prickly, was given in reference to the rough or warty character of the sprouts which spring from the root, and which are often used for propagation. And now, over a hundred years later, it has found its way to us.

Mr. Eisen's account of the Pepino will be interesting in this connection. "The Central American name of this plant," he writes, "is Pepino. Under this name it is known everywhere in the Central American highlands, and under this name only. But as Pepino in Spanish also means Cucumber, it was thought best to give the plant an English name. I suggested the name Melon-shrub, but through the error or the wisdom of a printer the name was changed to Melon Pear, which I confess is not very appropriate, but still no less so than Pear Guava, Alligator Pear, Rose Apple, Strawberry Guava, Mango Apple, Custard Apple, etc. . . . As to the value of the fruit and the success of it in the United States, only time will tell. The fact that I found the plant growing only on the high land where the temperature in the shade seldom reaches seventy-five degrees, Fahrenheit, suggested to me the probability that it would fruit in a more northern latitude. In California it has proved a success in the cooler parts, such as in Los Angeles city, and in several places in the Coast-range, and will undoubtedly fruit in many other localities where it is not too hot. . . . In pulp and skin the Pepino resembles somewhat the Bartlett pear, but in taste more a musk-melon; but it has besides a most delicious acid, entirely wanting in melons, and quite peculiarly its own. In warm localities this acid does not develop, and this fact is the greatest drawback to the success of the fruit. The fruit has no seed, as a rule. And in all I have found only a dozen seeds, and those in fruit which came from Salama, in Guatemala, a

place rather too warm to produce the finest quality of fruit." Last year Mr. Eisen writes that "it has only succeeded in Florida, but has there proved of considerable value."*

The greatest fault of the Pepino appears to be its failure to set fruit. Mr. Eisen states that in Guatemala it "yields enormously, 100 to 150 fruits to a vine four feet in diameter being nothing uncommon. I have seen it yield similarly in California, but whenever exposed to too much heat and dryness it is very slow to set fruit." He recommends that it be shaded if it refuses to set fruit. Martin Benson, Dade County, Florida, writing to the *American Garden*, says that he has had great success with it. "I counted the fruits on a medium-sized plant and found it bore sixty, of all sizes, from those just set to some nearly matured, and weighing upward of a pound. The fruit varies considerably, but averages about the size of a goose-egg. It requires cool weather in order to set fruit, and never does so excepting during a norther or other cool spell, when the fruit sets in great quantities." In the northern states it has always proved a shy bearer, so far as the records show.

The Pepino is an unusually interesting plant, and if it could be made to set fruit more freely in the north, it would be an acquisition for the kitchen-garden and for market. It is a good ornamental plant, and, altogether, it is deserving of a wider reputation.

Notes.

Messrs. Pitcher & Manda announce an exhibition of Orchids, Palms, Ferns and rare plants, to be held at the United States Nurseries, Short Hills, New Jersey, from February 29th to March 5th, inclusive.

Professor W. G. Farlow's paper on "Diseases of Trees likely to follow Mechanical Injuries," read a year ago before the Massachusetts Historical Society, has been published in a small pamphlet. It gives an untechnical account of the structure of tree-trunks, with useful directions for protecting trees properly, for pruning them and for preventing the growth of fungi, as well as an earnest plea for the planting and careful tending of trees in city and village streets.

The directory in charge of the Florida exhibits for the Columbian World's Fair has announced that among these will be a specimen of *Torreya taxifolia*, the rare tree which has made the region about the head-waters of the Apalachicola famous. The *Florida Agriculturist* adds that *Pseudo-phoenix Sargentii*, the rare Palm discovered in 1886 on Elliott's Key, and *Ficus aurea*, the Wild Fig of south Florida, should be included among the exclusive arboreal productions of Florida. *Ficus aurea*, however, is known to be an inhabitant of the Bahama Islands.

How subtle are the Japanese rules for arranging flowers and how arbitrary, according to our western ideas, may be shown by the numerical proportions which they usually observe between leaves and flowers in an arrangement of Irises. With three leaves they use one flower, with seven leaves two flowers, with eleven leaves five flowers, with thirteen leaves only three flowers, and with fifteen only two again. But when we examine pictures that show the results of the application of these rules, we are convinced that they have been dictated by a very true feeling for artistic effects of the most delicate sort.

It was not known until of late years from what plant bay-rum was prepared, but it is now ascertained, says the *Bulletin of the Jamaica Botanical Department*, that it is manufactured in Dominica from the dried leaves of *Pimenta acris*. Bay-rum is procured by distillation, and this in a very simple manner. The leaves are picked from the trees and then dried; in this state they are placed in the retort, which is then filled with water, and the process of distillation is carried on. The vapor is then condensed in the usual way, and forms what is known as "bay oil," a very small quantity of which is required for each puncheon of rum. The manufacture of bay-rum is carried on at the northern end of Dominica, and proves a very lucrative business to those engaged in it, as the plants are plentiful in this district.

Erfurt is one of the great seed-growing centres of Europe, and one firm there devotes a hundred acres to the raising of the seed of China Asters alone. A late number of the *Gardeners' Chronicle* contains a picture of Mr. T. C. Heimemann's Aster-farm, a great level, carpeted with flowers and stretching away almost as far as the eye can reach. Great care is said to be taken to keep the several types of these plants true to character and of uniform quality, and the competition among the

growers in Germany operates to maintain these features. The introduction of new types during the past ten or twelve years, among which the Comet Aster may be named as a striking example, has been remarkable. Early blooming is necessary to secure a good harvest of plump well-matured seed, and the finest and the most productive plants are said to be produced from seed sown about the end of March in frames. The seedlings, when large enough, are pricked out in prepared beds in the open air, where some protection is given them by night when required. Many growers transplant them again about the first half of June, when the plants are given abundant room to develop.

Dr. C. F. Millsbaugh, of the West Virginia Experiment Station, in a late bulletin, gives an analysis of many common weeds to show their comparative manurial value. They vary very largely in the percentages of nitrogen, phosphoric acid and potash which they contain, one of the Evening Primroses, for example, containing only one per cent. of nitrogen, while the Poke Weed contains nearly three and a half per cent. A dry ton of Poke Weed contains these elements to the value of \$22.00. It would seem, therefore, well worth while to make a compost heap of weeds and carefully save the Poke Weed, Bitter Dock and Thistle, which are the most valuable. The better method of preparing such a heap in an open field is to lay on the ground a base of fence-rails or poles, which will allow a circulation of air, and upon this to throw a load of weeds, and then scatter over them plaster at the rate of a hundred pounds per ton. Then place another layer of weeds and more plaster, and so on until the heap is of suitable size. When completed, the heap should be covered with earth or turf, and at the end of five days, unless it is wet, some water should be thrown on it to assist the process of decomposition. Not enough, however, should be used to leach through. The heap ought to be ripe enough to use after two months' standing.

Professor Byron D. Halsted's paper on "Eastern and Western Weeds," read last summer in Washington, has recently been printed in the *Bulletin of the Torrey Botanical Club*. It was based upon "the reports of a number of botanists and crop-growers throughout the United States, received in response to letters sent to them or questions asked through the public press," but the basis taken for a detailed comparison of eastern and western weeds was the weeds of New Jersey and Iowa, as Professor Halsted had lived in both these states and personally studied his subject there. His classification of weeds as "worst," "bad" and "indifferent," and again as annuals, biennials and perennials, shows that, as regards the weeds of Iowa, "in passing from the worst class through the middle class to the indifferent, the percentage of perennials rapidly increases." Nearly half the weeds in New Jersey are foreigners—130 introduced species having been enumerated there as against 87 in Iowa, and the increase being "mostly among the worst and bad sorts." On the other hand, while New Jersey counts 135 native weeds Iowa counts 210, but the species not common to both states are "mostly of the third-class weeds, native in large part to the prairie," which, as a rule, "quickly disappear when the land is placed under cultivation," and many of which, in localities where they do not grow so rampantly, would be highly esteemed for their beauty. In general, says Professor Halsted, the whole east, as compared with the west, "is overrun with a larger number of the most aggressive weeds—weeds that assert their ability to resist the forces of the cultivator and plant their banners upon the tilled ground, likewise annual weeds that stock the soil with a multitude of seeds ready to spring into life whenever an opportunity offers.

Catalogues Received.

J. S. COLLINS & SON, Moorestown, Burlington County, N. J.; Small Fruits, Fruit and Ornamental Trees.—A. T. COOK, Hyde Park, N. Y.; Flower and Vegetable Seeds.—HENRY A. DREER, 714 Chestnut Street, Philadelphia, Pa.; Choice Vegetable, Field and Flower Seeds, New, Rare and Beautiful Plants, Garden Implements and Fertilizers.—H. G. FAUST & CO., Philadelphia, Pa.; Garden, Field and Flower Seeds.—EDWARD GILLET, Southwick, Mass.; Wild Flowers and Ferns, Bulbs, Hardy Ornamentals, Native Shrubs, etc.—H. GUSMUS, Klagenfurt, Austria; Export Price-list of Pæonies, Lilies and other Bulbs and Roots.—G. H. & J. H. HALE, South Glastonbury, Conn.; Choice Small Fruit Plants.—HENRY LUTTS, Youngstown, Ohio; Guide to Plum Culture, New and Valuable Fruits.—JOHN R. & A. MURDOCH, Pittsburgh, Pa.; Flower and Vegetable Seeds, Bulbs, Plants, Vines, Shrubs, Fruit and Ornamental Trees.—F. G. PRATT, Concord, Mass.; Trees, Shrubs and Native Plants.—JOHN THORPE & SONS, Pearl River, N. Y.; Chrysanthemums, Flower and Vegetable Seeds, Bulbs.—T. W. WOOD & SONS, Richmond, Va.; Farm and Garden Seeds.

* GARDEN AND FOREST, iii., 471 (1890).

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLES:—Spruces and Firs on the Maine Coast. (With figure.)	97
The Yellowstone Park Company	98
Meeting of the New York Carnation Society	98
Notes on Nomenclature	98
New England Parks	99
Spring in West Virginia	100
PLANT NOTES:—Some Recent Portraits	100
FOREIGN CORRESPONDENCE:—London Letter	102
CULTURAL DEPARTMENT:—The Hardiness of the Satsuma Orange,	
Professor W. F. Massey	103
Pyrethrums	103
Covering Greenhouse Walls	104
Two Good Climbers	104
Veltheimia viridifolia, Saxifraga cuscuteformis, Saxifraga Campositi,	
J. N. G.	104
THE FOREST:—Forestry for the Farmer	104
CORRESPONDENCE:—A Japanese Flower Party	105
Carnations, New and Old	106
California Horticultural Affairs	106
Trees and City Officials	107
RECENT PUBLICATIONS	107
NOTES	107
ILLUSTRATION:—A Spruce Forest on the Coast of Maine, Fig. 17	101

Spruces and Firs on the Maine Coast.

AS the traveler passes the boundary of the state of Maine, on his way northward, he is conscious of a change in the silhouette of the forest against the sky. The dome-like outline, the great rounded masses begin to disappear, and in their place arise the serried lances of Spruces and Firs, which, fine as they are in detail, are the despair of the painter from the rigidity of the serrated line which they present. Italian artists, accustomed as they are to swelling slopes, maintain that Switzerland is unpaintable because the forms of the mountains lack grace of curve, and are sternly defiant and hard in outline, and one is conscious of this same artistic defect as he contemplates the Maine landscape, with the sharp tips of its evergreens standing out against the clear distant sky.

The farther north one goes along the coast the more exclusive becomes the Conifer. The native Larch, or Hackmatack, mingles its feathery branches with those of its more rigid neighbors, its cones showing dark among the soft green tufts of leaves, and only the light-foliaged Birch diversifies the sombre groups of Firs with its shining stems, like a white-robed woman at a funeral.

As the traveler turns from the shore to the interior, deciduous trees of the hardier varieties become more numerous, but the prevailing character of the coast landscape is such as is portrayed in the illustration on page 101, which is from a photograph taken at Southwest Harbor, Mount Desert, Maine.

In the cool moist atmosphere which suits their development, Spruces and Firs grow with surprising rapidity, apparently without regard to nourishment from the soil. The rockiest hill-sides clothe themselves suddenly with tiny green forms which shoot up in twenty years into an impenetrable forest. Granite ledges seem no obstacle to their growth; the sprout splits the rock in twain and pushes up bravely to the light and air among its taller brethren. On stony ground the roots of Spruces run

along the very surface of the soil, drawing sustenance from dead mosses and the thin stratum of earth formed by decaying vegetation, and fertilized by bits of the fish dropped by the birds which roost in the tall tops. One of the features of a sea-side wood is the shells of sea-urchins one is sure to find among the cones which sprinkle the mossy carpet.

When a great gale comes the Spruces tip over, having no tap-roots, and they will go on flourishing for some years after they have fallen, with only the dirt that clings to their straggling roots to preserve the vitality of the tree. In a hurricane the Firs snap off, or their trunks are twisted and torn from their base by the whirling of a cyclone, but the Spruces are bowled over like a lot of nine-pins, and lie in winrows like a giant crop mown by some Cyclopean hand.

Very beautiful are these growing forests in their youth. The roots of the pre-existent trees, either cut or fallen, leave soft mounds clothed with the loveliest mosses, with gray white caps or scarlet bonnets or brown hoods for blossoms. Here early spring-flowers bloom and wild vines clamber, and the paths are glossy with the leaves of Wintergreen and Pipsissewa. The young trees are symmetrical masses of foliage from root to point, and natural paths wind between them in intricate mazes, with fairy rings of open ground between the conifers. Sometimes a brook tumbles along among the shadows, which is crossed by stepping-stones, that lead into still more mysterious depths of this miniature wood, in its perfection of individual beauty when the trees are about twelve or fifteen years old.

After that the stronger trees begin to shoot up and wrestle for precedence—the space becomes crowded, the lower limbs, lacking light and room enough, begin to lose their foliage, twigs and dead branches strew the ground. The wood takes on a more sombre character; blossoms disappear; the thickets grow more difficult to penetrate; the cheerful garden gives place to the forest, with its solemn dignity, its church-like stillness and gloom, its heavy panopies of gray pendent mosses.

Only the osprey and the crow frequent these solitudes. Heavily the sea-eagle flaps his mighty wings, as laden with his prey he slowly sweeps to his ragged nest upon the summit of some lightning-blasted Fir, whence come the screams of his hungry brood. In the openings of the forest grave circles of crows hold their parliament with loud discourse and surly wrangling.

Now and then a solitary raven flies low along the edge of the wood, uttering a hoarse and melancholy croak; through the tall trunks can be discerned the black waters of a sullen sea, and the monotone of its utterance as it breaks against the crags below mingles with the unceasing murmur of the forest. A furled white sail makes a spot of light amid the stretch of restless water, where a wave at intervals breaks into foam, but it disappears in the distance, and only the great Spruces creak and groan in the rising wind, and answer the challenge of the sea with mutterings of defiance. On the edge of the cliff the little red-cheeked cranberries glow amid their glossy leaves, and down below, in its rocky clefts, hung all summer with Hare-bells, the clean outline of the Rock Poly-pod is visible against the crumbling granite wall. Now and then a fragment of this crashes into the gnawing sea at its base, which ever scourges and tears at its foundations like an avenging Fury.

Lonely and terrible are the old woods on the wind-torn coast. Beside the light-houses that comfort the mariner are seen the bare scathed trunks of dead trees, all blown one way like sign-posts of destruction. The leaping waves seem ever striving to reach them, and these gaunt wraiths of trees take on eldritch forms, and seem to wave defiant arms at their watery enemies. But still the young Spruces and Firs grow and thrive upon the ruins of their ancestors, clothing the crags with verdure, and renewing daily the youth of the eternal forest, which braces itself afresh to the unending combat with the elements.

EVER since the Yellowstone Park was created the Secretaries of the Interior have had charge of it, and superintendents and other officers have acted under their authority. The successive Secretaries have given much time and consideration to this territory, and the best friends of the park have been satisfied with the care which it has received from these officers. On the 1st of February a bill was introduced into the Senate for the alleged purpose of incorporating the Yellowstone Park Company, but if enacted it would practically operate to surrender the park to four men, who are named in the bill, for twenty years, with the privilege of renewing their power for twenty years longer. The act is shrewdly drawn, so as to have an appearance of maintaining the rights of the park, while really it gives this company power to build hotels, to run cable-cars, to quarry stone, to manufacture brick, to use timber for building and fuel, and, in fact, to do what they please without any restraining power whatever. Hitherto it has been in the power of the Secretary of the Interior to grant all leases and to make all contracts, and the only safety for the park is to leave it under the care and authority of some person in high official position like a member of the Cabinet. One can hardly conceive of a more impudent demand than this one of four men for a monopoly of this immense territory and all its resources.

THE first annual meeting of the New York Carnation Society, which was held at Buffalo on the 16th of February, leads one to wish that similar societies might be formed and similar meetings held by persons specially interested in the cultivation of the Rose, the Chrysanthemum, the Dahlia and other flowers. Advances in horticultural art have usually been made by students who devote themselves to specialties of some kind. The general public are not warmly interested in the development of so-called florists' flowers—that is, flowers which are molded into a fixed form, and which are not considered to have any merit unless they conform to some rigid outline decided upon by a committee as to true and ideal form. But every lover of flowers is interested in what patient and careful attention will accomplish in the way of discovering the best methods of cultivation, of hybridizing, of combating diseases, of increasing vigor and prolonging the blooming season of good plants. At this first meeting of the Carnation Society there were discussions of the highest practical value about the Carnation Rust, the alleged deterioration of varieties, the best methods of propagation, and other equally important topics. It is only through long-continued and special study that we can learn the secrets of the growth of plants, and every organization that tends to direct intelligent attention to plants and their ways deserves the best wishes of every one interested in horticulture.

Notes on Nomenclature.

QUERCUS KELLOGGII, Newberry.—The oldest name applied to this species is that of Torrey, *Quercus tinctoria*, var. *Californica*, published in 1856 (*Pacif. R. R. Report*, iv., 138), here being considered only a variety of the eastern Quercitron Oak, and antedating the *Q. Kelloggii* of Newberry (*Pacif. R. R. Report*, vi., 89, 28, f. 6 [1857]) by one year. As no question now remains as to the specific distinctness of Kellogg's Oak from its eastern relative, there appears to be no good reason for not following Cooper, who was first to raise Torrey's name to specific rank (*Smithsonian Report* for 1858, 261 [1859]), *Q. Kelloggii*, Newberry, would, therefore, become *Q. Californica*, Cooper.

It is perhaps to be regretted that the specific name, *Kelloggii*, can be no longer retained in honor of the one who studied the Pacific Oaks so carefully; it is certain, however, that as with the "Douglas Spruce" (*Pseudotsuga Douglasi* becoming *P. taxifolia*), "Kellogg's Oak" should always stand first as a vernacular name.

QUERCUS TINCTORIA, Bartram.—Bartram's name for the Quercitron Oak, although long maintained for this species, seems nevertheless not to be legitimate, nor by any means the oldest one applied to the tree. Aside, moreover, from the fact that it is antedated by others, the name itself is not even founded on a diagnosis of the species; yet the tendency among fair-minded botanists and zoölogists to interpret rather the intent of nomenclatural codes than to adhere too rigidly to the literal meaning of a prescribed law, would perhaps enable us to still retain *tinctoria* as a specific name, although founded only on the following statement:

"Gigantic black Oak, *Querc. tinctoria*; the bark of this species of Oak is found to afford a valuable yellow dye. This tree is known by the name of Black Oak in Pennsylvania, New Jersey, New York and New England. . . . I can assert that many of the Black Oaks measure nine, ten and eleven feet in diameter five feet above ground" (Bartram, *Travels*, p. 37 [1791]). Doubtless the large size and production of a yellow dye, aided by a system of seclusion, points circumstantially to the Quercitron Oak.

There are, though, cases in which the first name, similarly established, has been discarded for a later one secured by a strictly technical diagnosis; so that those inclined to follow the letter of the code may not complain if *tinctoria* be set aside for an older if not the oldest name.

The oldest name suspected to belong here is the *Quercus velutina* of Lamarck (*Encycl. Meth. Bot.*, i., 721), published in 1789, two years previous to Bartram's *Quercus tinctoria* (1791). Koch (*Dendrologie*, ii, pt. 2, 68) took up Lamarck's name, but seems not to have been followed by any subsequent writers. Professor Sargent questions the validity of *Quercus velutina*, and cites it as a synonym of *Quercus tinctoria* (*Cat. For. Trees*, 149). But while there must always remain doubt in the identification of names in the absence of good figures or specimens, there seems to be as good reason for taking up *Quercus velutina*, Lamarck, as for still retaining *Quercus rubra* of Linnæus. Of *Quercus velutina*, Lamarck says, "*Quercus foliis obovatis angulatis subtus brevissimè lanatis, angulis seta terminatis*" (l. c.); of *Quercus rubra*, Linnæus says, "*Quercus foliis obtuse-sinuatis setaceo-mucronatis*" (*Spec.*, ed. 1, 996). Certainly the foundation of Linnæus' name—which as the oldest no one thinks of disturbing—can as well be questioned as the propriety of establishing Lamarck's *Quercus velutina*, the oldest name for the Quercitron.

An older name also for this Oak than Bartram's *Quercus tinctoria* (1791) is the *Quercus discolor* of Aiton (*Hortus Kewensis*, iii., 358), published in 1789.

QUERCUS FALCATA, Michaux.—As already pointed out by Professor Sargent (*GARDEN AND FOREST*, ii., 471), there are two or three other names included in the synonymy of this species which are much older than Michaux's *Quercus falcata* (1801). Wangenheim's *Quercus cuneata* (1787) has, however, been selected as the only authentic name to supplant Michaux's *Quercus falcata*. Of the identity of *Quercus cuneata* there can, of course, be no doubt, based as it is on a figure of a well-known form of the plant. But before passing this point, it may be advisable, since the inconvenience of a change must be made from *Quercus falcata*, to inquire if there is not sufficient reason for taking up Marshall's *Quercus nigra digitata* (1785), the oldest name supposed to have been applied to the Spanish Oak. His *Quercus rubra Montana* may also belong here, but occurs later in the *Arbustum*. Of the two descriptions, the first and the one under "*Quercus nigra digitata*" seems to be the more suggestive of the species Marshall had in hand, and under this caption, "*Quercus nigra digitata*—Finger-leaved Black Oak," he says:

"This grows naturally in low lands, rising to the height of thirty or forty feet, with a trunk of considerable thickness, covered with a rough blackish bark. The leaves are sinuated, or divided toward their extremities into two or three pretty long, somewhat finger-shaped, lobes of unequal length, with others shorter, sometimes at the sides; all of

which end in a bristly point. The acorns are small, but the cups pretty large."

What other of our eastern species Marshall could have had in hand than the common trilobed form of the Spanish Oak is difficult to imagine, nor does it require a stretch of imagination to suppose that the name and description apply to this Oak. If this be conceded, the *Quercus falcata* of Michaux becomes *Quercus digitata*, Marshall.

Forestry Division,
Dep't of Agriculture, Washington.

George B. Sudworth.

New England Parks.

THE MIDDLESEX FELLS.

THOUGH the Middlesex Fells are only a park in prospect, the hope is so confidently entertained that they will be acquired by the state for public purposes, that I take the liberty of classing that natural pleasure-ground among those which already belong to the public by gift or purchase.

Already a movement is on foot to acquire the four thousand acres of rolling woodland which are included in this region, to retain it as a breathing-place for that greater Boston which is in time to surround the important peninsula, as Paris encircles the island in the Seine, and as London surrounds "the City." This great scheme of consolidation commends itself to the imagination for its splendid possibilities, and as we see Boston extending itself throughout its charming suburbs, with which it keeps itself far more in touch than New York and Philadelphia do with theirs, the time seems not far away when the city will include them entirely, and while a system of prefectures shall provide for the local government of the outlying departments, the towns within a twelve-mile radius may come under the wing of a central municipal government. Politically one cannot wholly be reconciled to this fine scheme, but theoretically it has a picturesque splendor, and if it is ever achieved the Middlesex Fells will be an important centre for the numerous towns that border upon the region—Melrose, Medford, Winchester and Malden all abutting upon the open spaces which will in time be so precious to the city-dweller.

What are the Middlesex Fells? is often asked, now that this felicitous title, first applied to them some twelve years ago by that true lover of nature, Mr. Sylvester Baxter, has passed into such popular acceptance that they even have a local habitation as well as a name, in a small railway-station known to the succinct Pathfinder as Fells.

These fells are a series of low, well-wooded hills, the highest of which is some 300 feet in altitude, which are easily accessible from the western division of the Boston and Maine Railroad, from either Malden, Medford or Melrose. To visit them extensively and thoroughly in a short time a carriage is necessary, and by alighting at Melrose, where one can easily be procured near the station, a few hours will enable one to explore them satisfactorily. To those who live near by they afford charming possibilities for tramps and climbs, already discovered by the Appalachian Club, and as good roads through them abound, they can comfortably be explored on a bicycle, with occasional digressions on foot from the beaten track.

The first point of note in the Melrose section is Pine Bank, the property of Mr. E. S. Converse, where, among other interesting features, a curious glacial moraine, covered with fine old conifers, is interesting to visit. This ridge of land, deposited by some long-departed glacier, carpeted thickly and softly with Pine-needles, slopes on either hand to ravines, also well wooded with Pines and Hemlocks. The long, straight walk under their sighing branches is very beautiful, and the formation of the moraine is full of interest and suggestion.

The wildness of this part of Mr. Converse's estate, the pleasing views from its elevations, and the beauty of the trees, render it very attractive. I am told that should the Middlesex Fells be acquired by the state, it is the purpose of Mr. Converse to give a portion of this valuable property to the public; another instance of the noble generosity of the citizens of the Commonwealth of Massachusetts.

From this point a short drive brings one to the Cascades, a fine natural feature. Leaving the high-road, a climb through a grove of Oak-trees brings one to the foot of an eminence, from the top of which a stream comes tumbling down over a rocky cliff, dripping from ledge to ledge of the fern-hung rocks mossy with the perpetual moisture, and rippling noisily away in a stony brook below. This cataract, which in spring, when swollen by the melting snows and frequent rains, must be quite wonderful, was, when I saw it, so shrunken by the long drought that it was but a Staubbach of a fall, and

showed little more than a trickle down the face of the massive rocks, picturesque with their drapery of Ferns and Lichens.

In a park, with proper treatment, these cascades would be very effective, and paths might lead easily to the top of the hill, which now can only be scaled by some rather rough scrambling.

Another charming object in the Fells is Spot Pond, a lovely sheet of water bordered by woods, along which the road leads in attractive windings that give varying views of distant hills behind the blue water. In the neighborhood of the pond is the Langwood Hotel, a spacious hostelry with large verandas enclosed in glass, which is open to visitors at all seasons of the year. Here we dined comfortably at a table artistically strewn with brown Chesnut-leaves, and had a chance to appreciate the taste and skill which have presided over the appointments of this pleasant inn.

But of all the many points of view in the Fells, with its numerous drives and walks, affording constant variety of landscape, that which we obtained by climbing Bear Hill was the most beautiful and striking. This is an elevation of some three or four hundred feet, to which one climbs through thick woods, up a steep slope, encountering fences and snags by the way, but coming out at last upon a cleared summit from which there is a famous outlook.

Seen of a soft day in early November, with the distant hills bathed and glorified in the purple haze of Indian summer, the chimneys and towers of distant towns took on mysterious meaning, while Tufts College, upon its eminence, might well be mistaken for an imposing castle. Banks of hills rose one behind the other in tender diaphanous outline, the Milton Hills merely a hint against the sky, and the State-house dome a glimmering spark of fire amid the forest of pale spires that represented Boston. Translucent delectable mountains encircled the horizon, among which dim familiar peaks were visible. Monadnock and Wachusett were but mountain dreams in this vision, where the tiers of opalescent highlands, bathed in the low sunlight, were transfigured by the atmosphere of the dying year.

Near at hand gleamed the waters of Winchester reservoirs and Spot Pond. The woods of Lynn stretched away like a wilderness in the middle distance, while the neighboring summits of the Fells, crowned with trees and dwellings, clustered in undulating surface of varying heights about Bear Hill, from which the eastward scope of greater Boston could be clearly discerned, while up its steep sides clambered the Pines and Hemlocks, the Oaks and Maples that clothed it in a cloak of russet, faced with green. The top of the hill was bare of trees, but well furnished with masses of wild shrubs hung with fruit. The Privet showed its dark berries; the Berberies were gay with ruddy clusters; the Sumachs glowed with crimson leaf and deep red spikes of fruitage; mosses grew soft and green under foot; the Scrub Oaks clustered in brown groups, and acorns lay scattered on the ground. The tints, all soft and harmonious, ran through a scale of russet and copper-color to the duldest red. Stiff little Junipers rose here and there in the symmetry of early youth, some bluish and some of a deep yellow-green. The hill-side was slippery with the fresh-fallen leaves, which crackled under foot; vistas opened through the wood as we climbed and descended the hill that offered points of view in different directions, each picturesque with a new beauty.

An autumn day in the woods is one of the delights of existence; the cool fresh air renders exercise a pleasure; the transitory brightness makes each effect more precious, as if it were to be the last. The beauty of our atmosphere at this season is unrivaled even in Italy, where the same glamour is seen at other seasons. Moisture and smoke are the secret of the ineffable colorings of the Bay of Naples, for when a keen clear wind drives away the puffings of Vesuvius the sharp black volcanic outlines lose their beauty, and stand up in all their barren harshness, cold and awful and forbidding.

So when distant woods are burning and the air is humid and chill, our austere New England puts on a Neapolitan robe of azure and violet that rivals the hues of Capri and Amalfi. Her granite hills are transformed to porphyry and jasper, her prosaic outlines grow soft with strange suggestiveness. A far-off chimney becomes a campanile; a factory is glorified into a fortress; an institution looms like a chateau. There is a joy in the dim silhouette of distant roofs against the sky, an elevation in the curve of dome and upward lift of spire, a hint of mountain-ranges in a row of misty hill-tops.

What the imagination is to the mind, the atmosphere of Indian summer is to a Massachusetts landscape. Unreal, you say; but who shall dare to question the truth of Nature viewed, as she best loves to show her coquettish face, half-

veiled in violet gauzes? For Earth herself in her seductive moods loves to confound the realist, and to force him to lift his microscopic eye to behold her splendors with a vision too dazzled to dwell upon the scars and wounds man makes upon her noble bosom.

In that breadth of vision which excludes detail, in that elevation of view which reveals the type and not the individual, the grand sweep of the hills, and not their gravel-pits and quarries, the mighty mass of the forest, and not its unsightly clearings and half-dead trees, can Nature's highest beauty alone be revealed, and her loftiest aspects brought to light.

This is truth poetized, not the every-day appearance of a prospect, but that vision which, under rare conditions, comes to reveal to man the higher loveliness oftenest hidden from view, but none the less a true perception for him who has the power to sing his song, or paint his picture with the notes or color drawn from the inspiration of a fleeting moment, which he has the gift to make permanent.

Thus that November afternoon the Middlesex Fells became an enchanted region of pale sunlight and shadow, such as we might seek in vain to find on another occasion. Not always can it be bathed in such misty tints, or brightened with such mellow autumn hues as made its distances dreamy, and its foregrounds rich for the group that were privileged to see them in gala attire on that fortunate day. But as a possession for the state it will ever have a serious value, this open, breezy varied space of hill and valley, lake and woodland, which it would be a misfortune to sacrifice to any purely utilitarian idea.

Its natural ruggedness renders it difficult for building, impossible for agriculture, so that it has been preserved in natural wildness and beauty for this very time, when the best interests of the state demand that it should be made a reserve that will add incalculably to the real value of the neighboring towns, which can rejoice in its fine, health-giving opportunities, and gain new dignity from their neighborhood to so noble a pleasure-ground.

Hingham, Mass.

M. C. Robbins.

Spring in West Virginia.

THE advance-guard of spring reaches West Virginia early in February, and we celebrate its arrival with a feast of Water Cresses, which are as grateful to snow-wearied eyes as to the palate. The birds know very well that spring is coming, for in February the cardinal grosbeak whistles boldly on every frost-free morning, and the bluebird takes you into his confidence in his quiet fashion to say that the season of flowers is really at hand. The shrubberies on this 19th day of February are full of swelling buds, and even some insect life is discoverable here and there, and spider threads are seen thrown from one limb to another. Very striking is a low clump of Honey Locusts, the deep red spines of which make an effective contrast to the striped bark of the branches, a light gray on olive-green and very smooth and satiny in texture. These curious waves and markings are confined to the young growth and are conspicuous now. Later on, in the exquisite delicacy of its foliage, the red leaflets matching the thorns in color, it will rival any of the greenhouse Acacias. The Hypericums are already leafing out and *H. aureum* is fairly covered with its stiff linear leaflets, dark green with red and orange tints on the latest comers.

Wall-flowers are in bud, bulbs are peeping through the ground, some of the early Hyacinths which stand in a sheltered nook are already well advanced. *Spiræa prunifolia* shows many tiny leaves, while *S. Thunbergii* is covered with knobby flower-buds, as are some of the *Cydonias*, while others show a few blood-red leaves just starting, and they are almost as pretty as the blossoms. *Caragana altagana* shows a green rosette here and there, and is only waiting for two or three warm, sunny days to open more of its curious leaf-buds, which look like little blotches of green paint scattered over the branchlets. Among the flowers, Crocuses are following the Snowdrops, and *Chionodoxas* are hard after them, with the earliest Jonquils, Daffodils, Violets and the lesser Periwinkle almost in sight. These modest blossoms are the ones which the flower-lover prizes above any of the later, more abundant and more gorgeous blooms which the lavish month of May brings with it.

It is a good plan to have a space in the shrubberies devoted to the March bloomers, some of which are found in very few gardens. There is a very early-blooming *Rhododendron*, *R. Dauricum*, that is not planted half as often as it should be. *Daphne Mezereum* shows with us the first rosy bloom of the year, the predominating color for early spring flowers seeming to be yellow, purple and white. *Daphne Genkwa* is a

charming plant of slow growth and fragrant violet-colored flowers, and probably the sweetest shrub that blooms in March. Then there is the Leather-wood (*Dirca palustris*), which grows wild in our woods, displaying small yellow bunches of flowers about the time that the Marsh Marigolds brighten the forest-pools with their gold. This shrub is offered by some nurserymen, and it is of easy cultivation away from its native habitat. *Jasminum nudiflorum* is a graceful shrub of early bloom, and cheerful in spite of its weeping habit. It is deservedly a favorite with designers of parks, and is much used about the public buildings in Washington, where it celebrates Easter Sunday after a sunny fashion peculiar to itself. *Prunus spinosa* and *P. Pissardi* bloom here late in March and are rather earlier than the *Forsythias*.

In the wild garden the Blood-root, Saxifrage and Twin Leaf will bloom as the earliest Fern-fronds are unrolling, and they are quickly followed by *Hepaticas*, in their woolly overcoats, the first *Anemones* and the fragrant *Epigæa*, which some people are able to coax into forgetting its native haunts and blooming in civilized gardens. On the very first of February, which was a genial day, we found reddish brown barren catkins two inches long, and tiny unopened pistillate flowers on our Japanese Alder, and these gave as keen pleasure as the bloom of a favorite Rose-tree in June. These catkins are far in advance of all the flowers of our other trees. Scarlet Maples, Aspens, Willows and Hazels are growing more interesting as the days lengthen, but to this Alder belongs the glory of being the first tree to bloom in spring.

Every day we watch the earliest bloomers among the shrubs for signs of growth. *Xanthocerus sorbifolia*, which the youngest member of the family will call rhinoceros, receives much attention. It has not bloomed yet, being, indeed, only eighteen inches high, and it is not likely that it will gratify our curiosity for another year, but it is said to produce blossoms when very small. *Chimonanthus fragrans* is also of much interest, as it has never been seen in bloom here. The red-branched *Cornels*, the yellow-stemmed *Forsythias*, the green twigs of Scotch Broom and the Japanese *Corchorus* are also attractive, and the bark grows brighter on them all as the buds begin to swell. *Lonicera sempervirens* was the first of all our plants to show the tender green of its spring foliage.

Rose Brake, West Va.

Danske Dandridge.

Plant Notes.

Some Recent Portraits.

The February issue of the *Botanical Magazine* contains portraits of the great Javanese *Primula Imperialis* (t. 7217), a noble species, producing immense leaves and tall scapes, with many whorls of orange-colored flowers.

Hydnophytum Forbesii (t. 7218), a representative of the wonderful group of epiphytic plants, peculiar in their tuberous root-stalks, which form nests for certain species of ants. There are two principal genera of these plants, natives of the Malayan and Pacific coasts and islands, both belonging to *Rubiaceæ*, and closely allied one to the other. They are *Myrmecodia*, with eighteen species, and *Hydnophytum* with thirty, and they were mostly discovered by the distinguished Italian botanist Beccari, who has bestowed upon this group the appropriate name of *Piante ospitricce*. The tuberous rhizome of *Hydnophytum Forbesii* is lobed, echinate, and produces short stems with subsessile, obovate, obtuse leaves, and axillary, short-stemmed flowers with a short calyx and an elongated, graceful, cylindrical, white corolla. The fruit is ellipsoidal, bright red, drupaceous, slightly compressed and two-lobed at the apex. *Hydnophytum Forbesii*, which is certainly one of the most curious and interesting plants recently introduced into cultivation, was discovered in New Guinea by Mr. Forbes, author of *A Naturalist's Wanderings in the Eastern Archipelago*, who, in 1886, sent it to the Royal Gardens at Kew, where it flowered three years later, and again last year.

Begonia glaucophylla (t. 7219), a plant now well known in gardens, but of unknown origin and history, and possibly a hybrid.

Vicia Narbonensis (t. 7220), a native of eastern Europe and western Asia, and chiefly interesting for the fact that it has been supposed to be the original form of the common



Fig. 17.—A Spruce Forest on the Coast of Maine.—See page 97.

bean, a fact which De Candolle, in his *Origine des Plantes Cultivées*, does not find supported by sufficient evidence.

Neobenthamia gracilis (t. 7221), a singular terrestrial Orchid, a native of eastern tropical Africa, with long tufted sparingly branched stems, which attain a height of four

feet and which are clothed almost throughout with grassy leaves, and terminate with a raceme of small white flowers, with a short, hardly spreading perianth, and a lip spreading from the base and slightly recurved above the middle. *Neobenthamia*, a genus which serves to com-

memorate Mr. Bentham's labors in revising the genera of Orchids for the *Genera Plantarum*, was discovered by Sir John Kirk in the Zanzibar kingdom, and was sent by him in 1884 to Kew, where it flowered in 1890.

Foreign Correspondence.

London Letter.

THE last annual meeting of the Royal Horticultural Society was remarkable for the tone of satisfaction which pervaded the proceedings. The President, Sir Trevor Lawrence, announced that "the affairs of the society were in a thoroughly satisfactory condition," while Professor Michael Foster, an ex-member of the council, congratulated the society on the greatly improved outlook which was evident in the report, and upon the good work done by the present council. The society has paid its way, has increased its constituency by several hundreds in the year, has issued a valuable series of horticultural papers in its journal, and has held numerous exhibitions and conferences. As Baron Schroeder expressed it, the society is growing rapidly and will soon burst its skin, when he anticipates it will assume that position among the industrial societies of this country which it is now better qualified for than it has been at any time within the last twenty-five years. This improvement is solely due to the determination of the society to mind its own business, which is that of promoting all matters that tend to improve and develop horticultural art. There was a time in the history of the society when it went far beyond this, and as a result it not only found itself in financial straits, but it lost the sympathy and co-operation of the great body of horticulturists. The President alluded to the want of a suitable exhibition-hall and offices, expressing at the same time a hope that the society would be as well provided for in this respect as the horticultural societies in the United States are.

An exhibition of plants and flowers was held on the same day, and proved of exceptional interest and attraction. All the available space was filled with groups of beautifully grown Cyclamens, Primulas, New Holland plants, stove-plants, Orchids and fruit. Messrs. H. Low & Co., of Clapton and Enfield, are endeavoring to revive the cultivation of hard-wooded greenhouse-plants, such as Boronias, Correas, Acacias, Pimelias, Chorozemas and Eriostemons, which were a principal feature in English gardens a generation or so ago. Mr. Cannell marks the progress made, chiefly by himself be it said, in the improvement of the popular Chinese Primrose. The Messrs. Walker, of Hounslow, do the same for Cyclamens. No greenhouse-plant is more beautiful or more valuable than the Persian Cyclamen when it is well grown; but, as a very clever London grower remarked last year, although everybody knows their value and attempts their cultivation, it is only very few who have the luck to succeed. Orchids predominated over everything else shown. Large groups from the principal growers and interesting collections from various amateurs were numerous and full of attraction for connoisseurs. Among the notable specimens was *Phalænopsis Brymerianum*, a beautiful plant, with large healthy leaves and a strong flower-spike, from Messrs. Low & Co. This is one of the rarest of the Moth Orchids, only two or three others being known in cultivation. It is like *P. intermedia* in general characters, differing chiefly in being larger and darker-flowered. The variety of *P. Schilleriana*, recently named *purpurea*, was also exhibited by the Clapton firm. It differs from the type in being a shade darker in color. *Cymbidium Hookerianum*, a beautiful species rarely seen in flower, was shown, the spike having flowers larger than those of *C. giganteum*, with broad fleshy pea-green sepals and petals, and a large spreading three-lobed lip, colored creamy white, spotted and tinged with crimson.

Cypripedium Lindleyanum is a species with broad stout leaves, glossy green, margined with brown, and an erect

spike, a yard high, bearing large boat-shaped green bracts and curious brownish green flowers. It is a native of British Guiana, and is synonymous with *C. Kaietorum*. Various new hybrid *Cypripediums* were also shown, *C. Hera*, from Messrs. Veitch, *C. Juno* and *C. Ceres*, from Mr. Drewett, being awarded certificates. The first-named is a grand plant, the flowers enormous in size, well formed and attractive in color. It is the offspring of *C. Boxalli* and *C. Leeaanum*. *Lycaste Youngii*, as exhibited by the President, is a beautiful Orchid. It bore fifty flowers, not unlike those of *L. aromatica*, but brighter yellow and longer in the peduncle.

Among *Cattleyas* I noted some most beautiful varieties of *C. Percivaliana*, one with white flowers, named *alba*, being the rarest, but not the prettiest. A white variety of *C. Trianae*, some grand blooms of the rather refractory *C. speciosissima*, and a very dark-colored variety of *Lælia anceps* were exceptionally good. The large-flowered distinct *Oncidium Loxense*, which is one of the finest of the macranthum section, *Odontoglossum ramosissimum* and *Oncidium splendidum* were represented in excellent form, the *Odontoglossum* much better than I thought it could be. Evidently this is a very variable species. A new hybrid *Zygopetalum* named *Leucochilum* was shown by Messrs. Veitch, the raisers, its parents being the diverse *Z. Burkei* and *Z. Mackayi*, and several new hybrid *Dendrobiums* were submitted for certificates, and in some cases obtained them. The pretty little alpine, *Oncidium Phalænopsis*, was shown in considerable variety by Messrs. Sander & Co. In my opinion this is one of the most charming of small Orchids for the cool house. It often fails under cultivation because it is kept warmer than is good for it. From the same firm came *Epidendrum Watsonianum*, a species remarkable for its large pear-shaped pseudo-bulbs, spikes as thick as a man's thumb and of great length; the flowers are like those of *E. verens* in shape and size, but colored apricot-yellow, mottled with green, the tip being white, with rosy spots. *Disa Cooperi*, from Natal, was represented in the St. Albans group by a strong plant bearing a spike eighteen inches high of yellowish green flowers, in which the fat upward projecting spur is extremely odd. *Odontoglossum Edwardii* and a variety of it named *Ioplocen*, the latter very fragrant, and with longer sepals than the type, were conspicuous, the rich violet-purple of their flowers being exceptional among Orchids.

Bertolonias were exhibited by Mr. F. Bause, the well-known raiser of hybrid *Dracænas*, *Coleus*, etc., in much grander colors and vigorous health than I had ever seen them. Mr. Bause is almost a magician in the way he manages many plants. These *Sonerilas*, for instance, were in four-inch pots, yet they were ten inches high, had leaves as large as an ordinary sheet of note paper, and colors as rich as rubies. I asked him what the manure was. "Oh, common soil, just; you merely want to keep them close to the glass in a warm little house, don't coddle them, and don't let them flower." He saw no reason why *Bertolonias* should not be grown two feet high! Kew exhibited a very large head of flowers of the new *Brownea Crawfordii*, which was declared to be the finest of all *Brownæas*; a spike of *Aloe supralævis*, mistaken by most people for a "grand new *Kniphofia*"; *Greyia Sutherlandii*, the beautiful crimson-flowered Saxifragaceous shrub from Natal and *Hæmanthus magnifica*. Messrs. Veitch sent a basket of plants in flower of the new *Lachenalia Aureliana*, which is simply a bright-colored form of the old *L. pendula*. Some pretty specimens of trees and shrubs in flower, said to be from the open ground, were contributed by the same firm. They included *Amygdalus Davidiana*, with its variety, *alba*, and *Lonicera Standishii*. These would be worth growing largely for forcing in winter.

INTERNATIONAL HORTICULTURAL EXHIBITION.—Preparations are being made for what it is hoped will prove a comprehensive exhibition of gardens, garden products, garden art—of everything, in fact, appertaining to horticulture. It is to be held on the grounds which were prepared some years

ago for the American Exhibition held in London, and which have since been annually devoted to other exhibitions from Germany, Italy, etc. According to the prospectus, this exhibition, which is to open in May and continue till October, is to display the state of progress of horticultural science, taste, resources, implements and plant culture at the present date, and, in addition, the various departments and exhibits will serve as models for every one who loves a garden. Examples of the gardens of all ages will be prepared, including restorations of the ancient gardens of Egypt, Greece and Rome; copies of those in China and Japan, and types of the Baronial, Italian, Tudor, Jacobean, Georgian and Victorian eras. A large sub-tropical garden will also form a feature of the attractions offered. The tea-gardens of India and Ceylon will be represented, illustrating the growth of the Tea-plant, etc. Arrangements have also been made whereby foreign countries will co-operate to show the progress in horticulture in their respective lands. Flower and fruit shows, special exhibits of American plants, Orchids, etc., will be held periodically. Lectures on practical gardening will be given regularly. Pictures and photographs and a reference library are being collected. The scheme is ambitious enough, and if it can be anything like accomplished it can scarcely fail of success. The chairman of the executive is Mr. H. E. Milner, F.L.S., who practices as a landscape-gardener in England, and whose book upon this department of horticulture was published about a year ago.

London.

W. Watson.

Cultural Department.

The Hardiness of the Satsuma Orange.

HAVING been deeply interested in this Orange, the hardiness of which has been so much talked about, I have from time to time written notes of its encouraging behavior here. I have now to record that it has reached the limit of its hardiness with full exposure. My trees were purposely planted on the most exposed spot I could select, a hill-top 400 feet above tide, which has the unbroken sweep of the north wind for miles. In the winter of 1890-91 the lowest temperature noted was nineteen degrees, Fahrenheit, and no harm was done to foliage or wood. January of the present year was a cold stormy month, and the trees were subjected several times to this same and a little lower temperature. But on January 26th the mercury suddenly fell, with a cloudless sky, to sixteen degrees by the sheltered thermometer, and several degrees lower by a thermometer exposed in the air near the trees. The result is that they are badly cut, and the young shoots killed. It would seem, then, that the extreme cold these trees will endure without harm is from eighteen to twenty degrees above zero, so the hope that they might prove entirely hardy, as has been suggested, "as far north as Delaware," is doomed to disappointment. They seem to be just about as hardy as the Fig. Fig-trees of the same age subjected to the same exposure as these Oranges are killed-back to about the same extent, while Figs a few yards away south of the hill-top, and protected by Pine-boughs stuck along between the rows, are entirely unharmed. This indicates that the Satsuma may be grown with complete success here in sheltered places and in our coast country from Morehead to Wilmington and about Newbern. Wherever, as in our coast plain, the *Gardenia florida* grows into a large shrub in full exposure, there the Satsuma will grow well, especially as the black peaty soil there will suit it better than our red clay. We have *Gardenias* growing unharmed under the shelter of our college walls, but there is little doubt that they would have been killed to the ground had they been in company with the *Satsumas*. Our trees are on the stock of *Citrus trifoliata*, and on this stock they will probably remain mere bushes, yet this makes it more easy to protect them, and in any sheltered spot where the Fig and *Gardenia* stand unharmed I have no doubt they can be grown.

Not far away from our *Satsuma* Oranges, but sheltered by buildings, we have a group of *Olivives*. The largest of these, a *Nevadillo Blanco*, in the centre of the group, is killed outright, while those on the outside have not even lost their leaves. These trees were planted only last spring, and those that survive may be able to endure greater cold hereafter. An *Ipomoea* from the lower Rio Grande (L. Texana), with a hard woody stem as stout as one's wrist, is killed to the ground, if not entirely dead, while a *Century-plant* (*Agave Americana*) on

the hill-top near the Oranges has lost only its outer leaves. *Pittosporum Tobira* shows not the slightest sign of injury, nor do any of the plants in my hedge of *Citrus trifoliata*.

Of course it is too soon to estimate the full amount of damage the winter may cause, as the sudden reverses of our spring are now to be encountered, but I think it is evident that the *Satsuma Orange* will come through in a battered condition.

Raleigh, N. C.

W. F. Massey.

Pyrethrums.

WITHIN the past few years both the double and single varieties of these fine border perennials have been improved to such a degree that it is hard to decide which ones to choose out of the long lists catalogued by dealers, especially since the new and high-priced varieties are naturally described as the best ever offered. It is always safe, however, to begin with well-tried kinds, and add the newer ones later if they are desired. *Pyrethrums* have met with much favor among hardy plant growers quite recently, as it is not very long since the fact of their hardiness was announced as a discovery in some gardening papers. There need be no longer any doubt as to their ability to winter in safety, but the way to insure this is to plant them in spring, so that they are well established by fall. The one thing *Pyrethrums* dislike of all else is disturbance of the root; once established and let alone success is certain. They seem to have little preference as to soils. I have grown them equally well in heavy soil and in a very sandy and dry one. The single varieties, especially the colored ones, are most in demand now, and for use as cut flowers they are far preferable to the double kinds. Even for border decoration the double varieties have a somewhat lumpy appearance when in bloom, and the first rain gives them a disheveled air, while the single flowers stand up fresh and bright. For both these reasons the double varieties are gradually making room for their more natural and graceful relatives, which present at the same time the oldest and most recent phases of the development of *Pyrethrum roseum*. The original is a native of the Caucasus, and is one of the plants from which is obtained the insect powder of commerce.

Some brief notes on propagating the most desirable varieties will explain the system which I have found satisfactory. By using it 300 plants were obtained from twenty in one year after they had been imported, and each of the 300 was better than the originals at the time of receiving them; for *Pyrethrums* are extremely difficult things to import successfully. As soon as frost leaves the ground these plants are among the first to show signs of growth, and when the first small leaves are developed the clumps should be lifted carefully and the soil shaken or washed off the roots, when it will be seen that all these young shoots may be easily severed from the root-stock, many of them with roots attached. Others may have no roots, and these may be placed in the propagating-bench, where they will speedily root, and when they may be potted in three-inch pots and carefully nursed for a few weeks before planting in the open ground. Those shoots that have roots when detached from the parent plant may be potted and placed at once in a cold frame, where they will grow on as if nothing had happened, and will even produce flowers in their season, but these are best pinched off as soon as they show, as this will induce the plant to make side shoots and become a much stronger plant for the next season. This method of propagation is very simple, and with a cold frame even a novice may increase plants in this way if he begins in time—that is, before the plants have made too much growth. If the work is delayed until the leaves are more advanced, and the sunshine is stronger, the plants will require shading, which will weaken them. The winter cold has few terrors for established *Pyrethrums*, but a hot dry summer after first planting them is most trying.

Pyrethrums, like most other hardy plants, may be easily raised from seed, and is a good way to form a collection quickly where they are required in quantity for cutting purposes. Named kinds may be acquired as chances offer. It seems scarcely necessary to name any kinds as being better than others. I have found that both French and English raisers have a set peculiar to themselves, and there is very little, if any, choice between them. A list taken from all would be too large for the needs of most gardens. It is quite difficult to obtain a good named set without importing them, which is perhaps explained by the fact that the annual demand is so great that growers find it hard to increase their stock rapidly enough to meet it. When the first cost is considered and the usual losses added, it is not surprising that so few are grown to name.

South Lancaster, Mass.

E. O. Orpet.

Covering Greenhouse Walls.

A BLANK wall, such as is often seen in small conservatories, especially those attached to dwellings, detracts greatly from the appearance of the house. Such a wall may be covered in various ways, and one very pretty way is by a screen of earth attached to the wall in which are planted a variety of small plants. Probably the easiest and best plan for such planting is to put strong screw-eyes into the wall at short distances apart, using eyes large enough to project three or four inches from the wall, and to these to fasten strong galvanized wire netting with meshes measuring from three to four inches. The space so formed should then be filled in with a coarse, open compost, in which the plants may be set through the meshes of the netting. A charming effect can thus be secured by a proper mixture of plants with bright foliage and Ferns. Among the former are Marantas, small Crotons, Anthuriums, Peperomias, *Isolepis gracilis*, *Hoffmannia refulgens*, small *Dracænas* and many others, while the list of Ferns may be an extended one. The *Adiantums* will naturally take a prominent place, such sorts as *A. cuneatum*, *A. hispidulum*, *A. capillus veneris* and *A. assimile* being almost indispensable, while some of the *Nephrolepis*, *Pteris serrulata* and *P. cretica*, in their various forms, are almost equally useful. If the wall to be covered is in a Fern-house, the covering may consist entirely of Ferns and Lycopods, without any admixture of other foliage-plants. Among the Lycopods, *Selaginella Wildenovii* is especially handsome for such use, the bluish tint of its fronds being remarkably attractive, but as the shoots of this species will sometimes attain a length of six or seven feet it becomes necessary to peg them into the soil in order to keep them from falling down. *S. uncinata* is also an admirable sort, and will cling closely to the soil without any special attention. *S. Martensii* and its variegated form are also useful plants for this purpose. Among Ferns the *Davallias*, and some of the *Polypodiums* and *Aspleniums*, should not be neglected. Little need be said as to cultivation, for unless the soil on the wall be overwatered before the plants become established, there will be but little difficulty in securing a healthy growth of the Ferns and other plants recommended.

Where the use of this plan would be inconvenient or impracticable, the wall may be readily covered with *Ficus stipulata* or *Pothos argyræa*, or other close-growing creepers, these two being decidedly among the best for the purpose, from the fact that their rootlets cling as firmly as those of the Virginia Creeper, and their foliage is neat. But whatever plants are used for this purpose they should be entirely free from scale, mealy bug or other insects, as it is practically impossible to clean them afterward, and when once infected with such vermin plants soon become disfigured or entirely ruined.

Holmesburg, Pa.

W. H. Taplin.

Two Good Climbers.

DURING the winter months no plants are more attractive than *Bignonia venusta* on account of its abundant flowers and their bright color. The flowers are tubular, three inches in length, with five oblong lobes, and a very bright orange color. They are produced in terminal axillary clusters in great profusion. A well-grown plant on the roof of a conservatory will have pendent sprays from two to five feet long, bearing hundreds of flower-clusters. The *Bignonia*, to attain such luxuriance, requires a good border to grow in, but it will also succeed well in a box three feet square and nine inches deep. Perfect drainage is necessary whether the plant is in box or border. Good turfy loam, with an admixture of one-third leaf-soil, or well-decomposed manure, makes a suitable soil, and if the loam is heavy sand may be added to keep it porous. Watering must be liberal during the growing season, with occasional liquid manure, and the foliage must be kept clean and healthy by syringing. The plant enjoys full light and an ordinary greenhouse temperature, requiring little shade in summer, as the matured wood produces more and better flowers than soft unripened wood. It continues in bloom for several weeks during the winter months. After flowering, all weak growths and branches that have produced flowers should be cut away, and new growth should be encouraged for next winter's flowers. The young shoots should be trained and tied to wires or rafters, as the tendrils, if not attended to, will soon form a tangled mass. This *Bignonia* is easily propagated by ordinary methods from young stiff side shoots in spring.

Lophospermum (*Maurandya*) *scandens* is a most graceful plant, and adapted to many modes of culture. As a winter-flowering plant it can be trained to wires under rafters of the

greenhouse or along under the angles of the rafters lengthwise, from which graceful branches will hang, producing freely rich *Gloxinia*-like flowers of a deep rosy tint. It is also adapted for trellis-work, but climbers on such pieces are usually stiff and formal. Most of them are best trained to wires under rafters or along the edges of benches lengthwise of the house. The stronger ones can be trained near the top of the house, others near the angle of the rafters below. The *Lophospermum* thrives well as an ordinary house or window plant in winter. Out-of-doors it is one of the best climbers for summer decoration, and it can be planted against rustic-work fences, poles, trained to wires or strings by the dwelling-house, piazza, or any other place where such plants delight to ramble. For pot-culture the soil should not be too rich. A mixture of good turfy loam and manure that has been laid up a season is useful for most kinds of greenhouse-plants, with an admixture of leaf-soil and sand to keep the soil porous. Good drainage is indispensable with all pot-grown plants. It is easily raised from seeds or cuttings early in the season, for summer use, and in August for winter-flowering.

Dongan Hills, N. Y.

Wm. Tricker.

Veltheimia viridifolia (*Aletris Capensis*) is one of those odd bulbous plants often to be found in private greenhouses, a reminiscence probably of the time when Cape bulbs were more popular than at present. Like most Cape bulbs, it seems to need cool treatment, with very cautious forcing and a perfect rest after flowering. At least, I find that the bloom is made abortive by too much heat. In the cool house bulbs started in the early fall form thick undulated dark green leaves. The flower-scape is smooth, spotted with brown, and about a foot high, and is furnished with numerous flowers in a rounded raceme. Individually these are rosy pink and spotted, and about an inch long, and make the plant, which is not a showy one, interesting in a collection. The bulbs are increased by offsets, or if the leaves are stripped and inserted in earth they are said to produce bulbs at the base.

Saxifraga cuscuteformis.—The Dodder Saxifrage is an interesting Japanese species, but owing to its peculiar cultural wants is not often seen in gardens. In habit it seems allied somewhat to *S. sarmentosa*, but the runners are fine and Dodder-like, whence the name. The plant is low-growing, with ovate leaves, which are beautifully reticulated with white. In the open it flowers in early summer, with abundant but small white flowers. It is not at all hardy, and its principal value is found as an ornament to the cool house, where, if kept free from too much moisture, it grows freely, and shows finer markings than when grown in the border. Outside, during mild weather, it flourishes in the raised border, pushing stolons underground to throw up leaves in unexpected places, but let dry hot weather come the plant quietly disappears; not to be lost, however, for it forms small corms, which are ready to revive under favorable conditions. A plant of this character is apt to exhaust the patience of all but those fond of peculiarly dainty subjects.

Saxifraga Camposii, or *S. Wallacei* of gardens, is a striking contrast to the above-named variety, and is probably one of the best of the smaller Saxifrages. It is hardy if protected from excessive moisture, and is also useful in the cold house. In such a house the flowers are just opening. These are white, not quite an inch in diameter, and very freely produced on stems three to six inches long. The foliage is flabellate, deeply cleft and toothed.

Elizabeth, N. J.

J. N. G.

The Forest.

Forestry for the Farmer.

A FEW weeks ago Mr. Gifford Pinchot read a paper on the above subject before the "New York Farmers," and we give below an abstract of it.

The term forestry has come to be associated in the United States very largely with the climatic influence of forests, and the much more important matter of forest-management has been almost wholly overlooked. This is unfortunate. Forest-management we can speak of in definite terms, but our knowledge of the influence of forests on climate is vague and incomplete. Moreover, much that has been said about it is palpable exaggeration. The whole question lacks the immediate interest to make it thoroughly practical. It cannot be expected that the average farmer will stint himself for fire-wood or refrain from increasing his winter supplies because of the climatic influence of the trees in his wood-lot. The climate

of the future stands small chance with him against the bitter climate of to-day. If this is all that forestry means to the farmer, it may as well stand aside. Tree-planting, except for ornament and protection against sun and wind, is likewise of little interest to him at present. Hitherto the men who have planted trees for profit have been those who could afford to lose their investment. The value of their most useful example will be better appreciated hereafter, but for the present it has little interest to the farmer whose small capital must be made to bring him immediate return. Planting is too costly in most cases, and the returns too distant and uncertain for the man of small means.

But if forestry can help the farmer to grow more railroad-ties and more cord-wood on his wood-lot, if it will increase instead of cutting down the return from the poorer land on his farm, it may be worth his attention. From its very nature this is just what forestry will do. Trees, which are a crop just as much as corn or wheat, will yield an abundant harvest just in proportion to the intelligent care they receive. And the care which woodlands of this kind need is neither minute nor costly. It is all given with the axe, and its quality depends mainly on the choice of the trees which are to fall. It is a difficult matter to formulate general rules for the care of a crop which may contain twenty or thirty different kinds of trees, each with its own requirements as to soil, moisture, light and shade. We are even ignorant, in very many cases, of just what these requirements are. There are certain fundamental principles, however, which the farmer ought to know, which he can easily apply, and which will improve his wood-lot if he does so. He should know, for instance, that the layer of vegetable mold which accumulates under a crop of trees is of the greatest importance to the rapid and healthy growth of his timber. He should know that this layer disappears on exposure to the sun and wind, and that consequently it is a good practice to cut clean only on rich land. In general it is better to take a tree here and there as it becomes ripe, or as it crowds too closely on more valuable specimens. He should apply this principle to the borders of his lot, and leave a dense fringe of low-branching trees and bushes along the edge of the cleared land.

There is a way of cutting over sprout-lands which will give the best results. The important points are to cut near the ground and not to tear the bark loose from the stump. There is a time for cutting which is better than others. There are ways of favoring the better kinds of trees so as to increase their proportion in the mixture. There are ways of cutting off Pine so that Pine will follow it, and not Chestnut or Oak. There are known reasons why certain species follow others after a clear cutting, and why others follow fires. These reasons may vary in each case and for each locality, but there are certain broad facts of the temperament of the different species which always lie at their base.

These are a few of the applications of forestry to the needs of the farmer. I have been indefinite in stating them, and I do not hesitate to admit that we cannot in all cases be precise. Forestry in the United States is so recent that we are far from being thoroughly acquainted with the silvicultural characters of our trees. The general principles of forestry, which are valid all the world over, have come to us from European experience, but the American details remain to be worked out. We know in general that certain trees require more shade in the forest during early youth than others, but we cannot enter fully into scientific detail. We have no systematic knowledge of the requirements and adaptations of our forest-flora in respect to soil, moisture and temperature, as to comparative value for sprout-lands, the age of cutting which will give the best results, and a mass of similar questions. But far more important than all this, the knowledge of how to set about forest-management is wholly lacking among American farmers. Nothing could be more natural, since there exists no good American example.

Forestry, then, offers the farmer certain definite advantages over his present methods of handling his wood-lot, and holds out still further benefits as the reward of wider knowledge. The farmer himself will necessarily have little to do with collecting and discussing the facts which are to yield this wider knowledge, for the reason, among others, that the object of it all does not appeal to him. He must first know what forest-management is and means, and forest-management can never be widely appreciated without concrete examples. Such an example, on a large scale, is about to be supplied by Mr. George W. Vanderbilt, on his estate at Biltmore, North Carolina.

The estate of Biltmore covers some 7,000 acres lying along and between the French Broad and Swannanoa rivers, at an altitude of about 2,000 feet. From the point of view of pic-

turesque beauty, the situation is an exceptionally fine one; but from the forester's point of view, the land is broken, hilly, and, for the most part, not rich. More than half the estate is under forest, chiefly of deciduous trees. In the past the forest has plainly suffered severely from fire, pasturage and indiscriminate cutting. About a thousand acres of the best land, chiefly along the rivers, are devoted to farming. The rest is at present largely waste land.

Here are conditions not unlike those of the average mountain-farm, at least in kind, and the results of this experiment will be of direct interest to farmers throughout a large part of the country. It is proposed to discover whether Biltmore Forest, far from rich as it is either in soil or trees, can be made to yield a uniform annual revenue for an indefinite number of years. It is hoped that this revenue will constitute a fair rate of interest on the value of the property. These things are to be brought about by introducing a rational system of forest-management, which will attempt to harvest each year so much as may be safely cut, but only so much, and under which the productive power of the forest will steadily increase. The forest will be looked upon as a great working capital whose function it is to produce interest, and which does not need to be destroyed in the process. This is, I believe, the only basis upon which forestry will ever become practically accepted among the masses of the people, and for this reason the experiment at Biltmore may perhaps not unfairly be regarded as one of the most important advances that forestry has yet made in this country.

It is too early to speak of the details of the management by means of which it is expected to accomplish these results. The detailed preliminary study of the forest, which must precede any complete plan of action, has not yet been made. It may be said, however, that the management will be based on European models, not adopted, but adapted to American needs. There will be several units of management, and probably as many distinct methods of treatment, both in obedience to the requirements of the forest and because the scope and value of the experiment will be so much the greater. Each unit will be subdivided into blocks or compartments, which will be surveyed and demarcated on the ground. These provisions, as well as many others, will be gathered together in a document called a Working Plan, which will forecast the succession of cuttings for perhaps a hundred years (or whatever the average age of the merchantable log may be found to be), and will prescribe it for five or ten. At the end of this shorter period a complete revision of the working plan will rectify mistakes and readjust the details of the management.

The attempt to do this new thing under the conditions I have described will result, it is hoped, in much knowledge of value to the farmer. First of all, it will draw his attention to the fact that there is such a thing in America as forest-management, and that will be a point gained. Then it will show him, if he chooses to learn, what forest-management means and how it is applied, for it is intended to make a fully illustrated exhibit of the Biltmore working plan at Chicago. But it will not appeal only to the farmer. As the first attempt of its kind in the United States, the experiment at Biltmore will have, it is hoped, a distinct national bearing and importance. It should do much to remove forestry from the anomalous and often illogical position into which the mistaken zeal of some of its friends has forced it, and to ground its roots in the solid earth of business common sense. Not only does it enter a new field, but it asserts a proposition which must ultimately lie at the base of forest-preservation in this country—namely, that it is not necessary to destroy a forest in order to make it pay.

New York.

Gifford Pinchot.

Correspondence.

A Japanese Flower Party.

To the Editor of GARDEN AND FOREST :

Sir,—In reading Mr. Conder's book on Japanese floral arrangements, recently so instructively reviewed in your columns, I was particularly pleased with the account he gives of the entertainments, at which, for the edification of the guests, the principal feature is the preparation by a member of the party of one of their fanciful bouquets, if indeed it is permissible to apply our occidental term to anything so poetical and conventional, as the graceful but singular grouping of a few twigs and flowers, which the Japanese admire.

This Oriental has brought "good form" down to the nicest point; indeed, to such an extent has he carried it that he is not even permitted to apply the wrong adjective to a flower, so

that one may imagine what dismay such a ceremony would create in the mind of a traveling Englishman accustomed to render his impressions by a few words-of-all-work. To find reasonable and appropriate equivalents applicable to flowers for his easy-going vocabulary of "jolly," "beastly," or "awfully," must tax the Briton's dictionary and his interpreter tremendously; for the Japanese, who admits no flower out of season, regulates his epithets to the occasion with equal precision, and the etiquette of his observations is as carefully regulated by the canon, as that of his performance of all ceremonial obligations.

When the flower party takes place, either by itself alone, or succeeding a banquet, the guests assemble in a room, where, in the alcove with a raised floor, devoted in all Japanese houses to the decorative features of the apartment, there may perhaps be seen a kakemono, or scroll, containing a picture or a poem hanging suspended to the wall. On a low stand there is a dainty tray, upon which are laid a few flowers or branches of Pine, Plum, Bamboo or Cherry; beside them are a pot of water, a pair of scissors, a little saw and a folded napkin, the shape and size and folds of which are also subjected to rules. To these are added the bits of wood or metal by which the stems are held in their proper place, or possibly a bronze crab or two to serve the same purpose in an ornamental way.

After the guests have been received with proper ceremonies and compliments, the host proceeds to roll up his picture or poem, lest the guest should be hampered by having to adapt his arrangement to its subject. Should the guest so desire, he may politely request the master of the house to leave it unrolled, in which case he will compose his monograph on that theme, adapting a Bamboo to a tiger, a Lotus to a stork, or a Chrysanthemum to a flight of butterflies, if that is the proper thing, or some other recondite allusion to the painting, only to be understood of those trained in this polite accomplishment. On whatever basis he proceeds, it is decidedly out of the ruling for the guest to ask for anything that has not been supplied. When the host produces the vase in which the arrangement is to be made, the polite visitor, if it is very beautiful, must protest that he can do nothing worthy of so fair a receptacle. Should the host insist, and his manners, I should think, would compel him always to waive this disclaimer, it is the duty of the performer to make his grouping as simple as possible, in order not to divert attention from the beauty of the flower-jar.

When the guest has completed his arrangement, in which he must be most careful to conform to the myriad rules in which he has been educated, he carefully clears up the litter and deposits it, with the napkin and all the tools except the scissors, upon the tray, which is removed by the host, who assists in gathering the debris. The scissors are delicately left, as a hint that the artist requests that anything redundant in his composition may be removed by the critical examiner, who is requested to improve upon the original idea.

The guests in turn inspect the vase and its contents, with refined and well-fitted compliments for each, the phrases being strictly adapted to the character of the article described—a Pine never being flattered with the same remark made to a Bamboo, a Lotus characterized with a word only legitimately applied to a Plum-branch with its snowy blossoms, nor a *Convolvulus* disgraced by the florid adjective that properly befits a Chrysanthemum. After the arrangement has been inspected by all the visitors, the artist must take it to pieces, unless especially requested by the giver of the entertainment to permit the honorable performance to remain intact for the glorification of his humble room. This final ceremony being over, the party breaks up, with more gracious civilities of leave-taking.

In inspecting the curious lines and curves of the branches and blossoms that compose a Japanese flower-grouping, which can never be called a nosegay, since fragrance is eschewed in its selection, the uninitiated wonder how the plants can be retained in the attitudes they are made to assume; but this mystery is solved when, in Mr. Conder's book, we find illustrations of the wires, and split Bamboos, and curiously shaped bits of wood, which really serve to keep them in place. When grouped in baskets, according to a usual Japanese custom, the stems are inserted in tubes of Bamboo filled with water, which serve to keep them fresh. There are also very interesting devices here revealed for preserving the freshness of flowers after they are culled, which may well be studied by our own builders of bouquets, to enhance the durability of the more fragile specimens. Indeed, in this pleasing art, as in more important ones, we may well borrow ideas from our oriental contemporaries, who, in delightful sentiment, in poetic restraint, and in the recognition of the value of simplicity, are the masters of us all.

New York.

Sidney Hyde.

Carnations, New and Old.

To the Editor of GARDEN AND FOREST:

Sir,—With the exception of the Chrysanthemum, no florist's flower has been so much improved as the Carnation. Few occupations are more fascinating than raising seedlings of this popular flower, and, in a commercial way, few ventures of the kind are more likely to be profitable. The result is, that a large number of enterprising and intelligent florists are devoting themselves to the cultivation of this flower, and the number is increasing every year. There is much diversity of opinion as to what constitutes an ideal Chrysanthemum-flower, owing to its wide variation in form, but in the case of the Carnation there is a unanimity of opinion which is striking. This ideal flower, for which all are working, should be at least three inches in diameter, full, globular (not flat), with stiff, long stems; petals well fringed, and powerfully fragrant. Grace Wilder, though not a new variety, comes nearest to this ideal, but lacks size, and is not as fragrant as some varieties.

I spent a profitable afternoon recently at Framingham, Massachusetts, among the raisers of Carnations there. Mr. Wight is well known as the raiser of Hector, probably the best of scarlet Carnations grown. It is a robust grower, giving abundance of large flowers of the brightest scarlet on long stems. There is every reason to believe it came as a seedling from Florence (Fisher).

Mr. Fisher has raised several standard varieties, among them being Anna Webb, the foremost crimson until the appearance of Ferdinand Mangold last year. There is very little difference, in general characteristics, between the two; the newer variety, however, possesses a superior constitution, and is not so liable to produce "dead blooms." Mrs. Fisher, the best white up to date, is also conceded to be the best cropper grown, Silver Spray (Simmonds) ranking next. During winter, and especially in dull weather, it has a tendency to become pink-tinged, but the raiser hopes, by a little cross breeding, to remedy this, and, judging from several promising seedlings on trial, he will succeed. I noted in Mr. Nicholson's greenhouse (also of Framingham) two of Mr. Fisher's seedlings, which he has on trial. They belong to the striped section, and should be extensively grown. Paxton is crimson striped on a white ground; it has a handsome and attractive flower, and is one of the heaviest winter-bloomers. Mary Fisher is the brightest terra cotta I have seen. It is scarlet striped on a yellow ground, suffused with violet. Though not a prolific winter-bloomer, it comes in with great force in spring.

The fame of Grace Wilder, which is generally considered the best pink Carnation, has stimulated much competition, and the rivalry has produced several excellent varieties, including Mrs. Mangold (Mangold), salmon-pink; Helen Galvin (Wight), rose; Tidal Wave (Simmonds); Century (C. T. Starr), and Fred Craighton. The most promising rival I have yet seen is a seedling of Mr. Fisher's, which is in every way a counterpart of Mrs. Fisher except in color, and should it prove as good on further trial as it now promises, it will be sure to take a leading place.

At Mr. Nicholson's I saw one of the finest houses of Carnations I have yet seen. The house is one hundred by twenty feet long, with a south-east aspect and three-quarter span. He plants on solid beds in the centre, and uses benches for the sides. His experience is that benches are somewhat better for winter-cropping, and that Anna Webb, with possibly a few other varieties, does better on benches, the reason being, perhaps, that benches are warmer, drier, and admit of frequent watering. On the contrary, Grace Wilder does better on a solid bed, and this is, perhaps, the secret of Tailby's uniform success with this variety. Mr. Nicholson was kind enough to give me a few dates and figures, which alone will give an idea of the abundance of the crop taken from this house. In September, 1890, 1,700 plants were put in, which number was reduced to 1,400 in February, to make room for other plants, but from that date until September, 1891, 120,000 blooms were cut, mostly with long stems. September, 1891, 1,950 plants were put in, and the average up to date has been 10,000 flowers a month.

Wellesley, Mass.

T. D. Hatfield.

California Horticultural Affairs.

To the Editor of GARDEN AND FOREST:

Sir,—This season I observe a great change in the demand for fruit-trees. Last year it was for Peaches and Apricots, but now Almonds and Prunes lead all the rest, and the nurseries cannot begin to supply the orchard-planters. Looking back over the last twenty years, I can remember many flurries in

the tree market. It is "everything by turns, and nothing long," in California. In 1875 my father burned thousands of Apricots because every one wanted Cherries; a few years later people could not be persuaded to plant Cherries, but they had much faith in Bartlett Pears. Almost every year the demand changed. Almonds have been favorites of planters perhaps three or four seasons in the last twenty years. So many were set in unsuitable soil that the years of heavy planting have added little to the profitable orchard area. The Almond will grow in many places where it will not fruit. The reason why Prunes and Almonds lead this season is probably because the product is so easily marketed. Dried fruit, nuts and raisins cost less freight, and freight is one of the most expensive items in California farming.

Some recent observations upon Fig-trees at the four outlying experiment stations of the State University are soon to be published. They show that the University has fifty-one varieties of Figs growing at the stations, and that a great difference exists among the varieties in point of hardiness. A new variety, Dorée Narbus, withstands with ease eighteen degrees of frost, while the well-known California Black, introduced by the Spanish priests more than a century ago, is badly frozen. As a rule, a temperature of twenty degrees is as low as the Fig can safely endure, but there is a greater range of difference among the leading varieties than in the case of most other deciduous fruits. Fig-growers, to be successful, will have to study tables of climate more carefully than heretofore.

Every year new light is thrown upon the climate of California, as signal service observers increase in number. It has been shown that a difference of a few feet in elevation or a few hundred yards in distance makes a vast difference in the climate. The Coast Range, for instance, though usually spoken of as one great mountain-chain, is really composed of many groups, isolated or linked closely together, all with valleys, high plateaus, river systems, cañons through which fogs and winds may sweep, and sheltered places of semi-tropic warmth. In general, it may be truthfully said that the areas of equable climate are limited; much of the foot-hill country is subject to more sudden changes and greater extremes of heat and cold than is generally shown by the misleading mean-temperature tables which sometimes appear in the newspapers. Land-speculators have sold thousands of acres as frostless, on which no horticultural skill could ever grow the orange, lemon and fig with profit or on a commercial scale. Hardly one-third of the trees of more tender species planted by hopeful land-owners are brought to successful bearing; the rest represent the inevitable waste of ignorance and folly. It is beginning to be understood in California that every orchardist should own a maximum and minimum thermometer, and that some one in every town, village and district should keep careful climatic observations.

The prospects for a satisfactory display at the Chicago Fair are still uncertain. There are hundreds of applicants for positions, but few of them seem to be practical outdoor men with comprehensive ideas of securing and displaying an adequate exhibition. In the line of orchard products the state will probably be well represented, particularly in oranges, olives and other semi-tropic fruits. Unless a better spirit of organization is shown, we shall fail in the scientific assembling and classifying of our products.

On the 27th of January the most noticeable flowers blooming in the garden at Niles, Alameda County, were Camellias, Catalonian Jasmine, Magnolia stellata, Japanese Apricot, Paper White and Chinese Narcissus, Tartarian Honeysuckles, Roman Hyacinths and some late Chrysanthemums. Among Roses the Papa Gontier and Safrano are perhaps the most floriferous at this season. Lamarque and Rosamond are also worth especial mention. There are Violets, Heliotropes, yellow Oxalis, and no end of Geraniums. The Daffodils are blooming, and in a week more the Japan Quince will be in flower; so will the double Cherry, Peach and Almond from Japan.

Niles, Cal.

Charles H. Shinn.

Trees and City Officials.

To the Editor of GARDEN AND FOREST:

Sir,—The ignorance of the average American municipal official as to even the money value of trees was rather strikingly illustrated in Philadelphia some twenty years ago. The Legislature having shown its appreciation of the use of small parks in a city by enacting that one of our few squares should be occupied by the new city hall, and the voters having selected for immolation the largest open space within the old city limits, it became necessary to remove the trees. Bids for the

job, which was required to be done in ten days, were advertised for, and a farmer living near the city tried his luck with the other bidders. He at first thought of offering to buy the trees for \$100, but experience suggested asking \$100 for relieving the city of its superfluous shade. After much entanglement in municipal and political red tape, he obtained the contract, which netted him over \$1,000 by the sale of the wood, in addition to the \$100 agreed upon. This gift of city property, with a ten per cent. bonus into the bargain, seems odd enough, but as the next bidder asked \$4,500 for the same work, the city's loss was at all events not as great as it might have been.

This was, it is true, twenty years ago, but to judge from the annual tree-butchering, miscalled trimming, in our streets, and from the neglected look of the trees in many parts of Fairmount Park, especially the Wissahickon woods, we would seem to have advanced but little as yet in our comprehension of how best to use these gifts of nature either for pleasure or profit.

Mount Airy, Philadelphia.

Charles C. Binney.

Recent Publications.

Our Trees. By John Robinson. Published by the Essex Institute, Salem, Massachusetts, 1891.

The articles of which this little book mainly consists were published originally in the *Salem Gazette*. Some additional matter has been introduced, and they are now offered in a neatly printed volume of one hundred and twenty pages. The book is strictly local, and is intended as a popular account of all the trees to be found in the streets and gardens of Salem and of the native trees in Essex County, Massachusetts. Salem seems to be a very good field for such a work as this, for ninety per cent. of all the trees native to New England may be found within the city's limits. The sketch is not confined, however, to native trees alone, for all the more important introduced species that are used in ornamental planting are named and described. The trees are taken up in botanical order and introduced in family groups, and the reader is directed to different parts of the city, or its immediate neighborhood, where examples of each species may be found and observed by any one who may care to do so. We do not remember any other guide-book of this kind, and its value is apparent when we consider that persons with some botanical knowledge, and familiar even with the rarer wild flowers, have often only a slight acquaintance with our trees—that is, they do not know them well enough to distinguish the different Oaks or the different Pines from each other, or to separate the Birches and Hornbeams, or to tell which cultivated trees are imported and which are native. If the young people of Salem, and the older ones for that matter, would take this book for a guide and study the various trees which are pointed out throughout the year, they would become pretty familiar with a great number of species, and they would acquire habits of observation which are a valuable part of mental training. The book contains many historical facts of local interest, besides the descriptions of the trees, and, altogether, the city of Salem is to be congratulated upon the possession of such a manual. It would be a benefaction to many other towns if so competent an observer as Mr. Robinson should give similar accounts of their trees, and if such treasuries of information were common they would help to remove the reproach that there are few American people who know even the names of the trees that grow in the streets through which they walk every day.

Notes.

The sixth annual Orchid show, under the direction of Messrs. Siebrecht & Wadley, will open on Wednesday, March 2d, at the Eden Musée, in this city.

One of the English papers states that some old bulbs of Cyclamen Persicum, kept in a cold Peach-house, were subjected to such a low temperature not long ago that the soil in which the bulbs were growing was frozen quite hard for several nights; and yet this did not seem to injure the plants appreciably.

Miss Mary E. Banning has presented to the State Museum of Natural History at Albany a list of the fleshy fungi of Maryland, which describes 179 species, fourteen of which are stated to be new. The manuscript, accompanied by 175 colored plates, has been bound in a large volume, and will doubtless be of much service to botanists.

At the Experiment Station at Kingston, Rhode Island, where there has been some study made of the disease known as the

Scab of the Potato, it has been found that spraying the seed potatoes, and the soil about them after they are in the furrows, with the Bordeaux mixture checks the development of the disease.

The Peruvian Trumpet Flower, a name which has been applied to *Brugmansia suaveolens*, will not endure frost, but *Meehans' Monthly* invites attention to the fact that it will stand very rough treatment, and this makes it a favorite everywhere for summer decoration. The plant can be taken up in the autumn and preserved in the cellar. The numerous large white trumpet-shaped flowers make it very attractive outside of the particular fragrance which is one of its characteristics.

Certain Japanese writers declare that in placing a floral design in a room care should be taken to contrast its style with that of the adjoining garden, an idea which seems fanciful to us, but is quite reasonable in Japan, where, during most of the year, the paper sides of the house are thrown wide open toward the garden. If the garden, say these writers, consists of an arrangement of lakes and hills, the floral group in the room is best when it has a moorland character; but if the garden be flat and waterless, then mountain-trees and water-plants may be used in the chamber.

Among the foreign plants which have become very troublesome in the Australasian islands the Sweet-brier holds a prominent place. "Introduced as a hedge-plant," says Professor George L. Goodale, "it has run over certain lands like a weed, and disputes every acre of some arable plots. From the facility with which it is propagated, it is almost ineradicable. There is something astonishing in the manner in which it gains and holds the ground." Gorse, Brambles and Thistles also prove much more difficult to eradicate in the southern hemisphere than in the northern, where they originated.

The Colorado Forestry Association has memorialized the President in behalf of a new forest-reservation, the most important one yet asked for, and including the crest of the Rocky Mountains. This range crosses the entire state, and its high interior region contains one hundred and forty peaks exceeding 11,000 feet in height. Vast areas of timber have already been desolated, and yet this is one of the chief distributing centres of the continental water-system containing the sources of the North Platte, the South Platte, the Arkansas, the Rio Grande, the Dolores, the Gunnison, the Grand, the White, the Yampa, streams which are not only important to Colorado, but to the neighboring states and territories. The petition designates for the proposed forest-reserve all public lands along the crest of the mountain-ranges and spurs of the state, and upon each side thereof for a distance of six miles, more or less, according to the width of the timber-belts in different localities.

At the late meeting of the Carnation Society Mr. Lonsdale exhibited some buds of Carnations with specimens of a kind of worm which had worked upon them before the flowers were expanded. In some cases the base of the calyx was eaten through. In other places the petals had been eaten where they had commenced to unfold. In most cases the objective point seemed to be the nectar at the base of the flower, although the petals also seem to have been devoured. Professor Riley identified the marauders as variegated cut worms (*Agrotis saucia*), and he suggested that they might have been brought into the greenhouse with the earth from some sod-land. He advised the spraying of the plants with Paris green at the rate of one-quarter of a pound to fifty gallons of water, and a thorough wetting of the soil with dilute kerosene-soap emulsion. According to a report in the *American Florist* the remedy was tested at once, and seems to have been effective.

The plant known variously as the Husk Tomato, the Strawberry Tomato, the Ground Cherry and the Dwarf Cape Gooseberry is a species of *Physalis* (*P. pubescens*), which has been cultivated for years and is well worth growing in the home garden. Professor Bailey has been making some experiments with this and other species of *Physalis*, of which he gives an account in a late bulletin. He has tested seven species, but only three of them have been cultivated as fruit-bearing plants. The chief objection to the one named above is its prostrate habit, which causes it to spread over too much ground. Professor Bailey has been unable to hybridize it with others. The species *P. Peruviana*, or the true Cape Gooseberry, is too late for our climate. It has been in cultivation for two centuries, and is a valuable food-plant in the Cape of Good Hope and New South Wales, where it is eaten in a variety of ways. The Pepper-leaved *Physalis* (*P. capsicifolia*), erroneously called *P. edulis*, is unfit for general cultivation for

fruit, although it is an interesting plant for the botanical student.

A recent bulletin from the Mississippi Experiment Station gives an account of the southern Tomato-blight, which was studied there a year ago by Dr. Halstead, and which had become so destructive as to cause alarm among the growers of that region. The blight is due to a bacterial germ. Plants first wilt, then lose their color and die. This blight seems to be identical with a bacterial disease of the Potato, and it can be communicated from one kind of plant to the other. The same seems to be true of a blight of Melons and other cucurbitaceous plants which prevails in the same region. If this is true, it is plain that the soil may become contaminated with bacteria from any one of these three crops, so as to make it unfit for either of the other two. The blight can be more readily disseminated by the Potato, since it is propagated by tubers, which may carry the germs. All the diseased plants and litter should be burned at harvest-time. Repetitions of either of the three crops on the same field should be avoided, and spraying with the Bordeaux mixture is recommended where fear of the blight is entertained. This treatment has proved efficacious in the case of the Potato.

A few months ago we quoted from the *Bulletin of the Torrey Botanical Club* an account of a Linden which had taken root in the decomposed wood of its own trunk. Mr. G. B. Sudworth, of the Forestry Division, of the Department of Agriculture, now reports in the same journal that he has observed a similar phenomenon in a small White Mulberry which stands in the grounds of the Department. The tree, he says, has been more seriously injured than was described to be the case with the Linden, "a considerable portion of its trunk being destroyed by decay. The adventitious roots spring from the free border of a longitudinal crack where the trunk forks, the edges of the wound having been 'healed' for some time, while the subsequent decomposition of the exposed inner layers of wood formed a quantity of mold, which, lying in contact with the healed borders, seems to have induced the growth of adventitious roots from one side into the decayed mass. In considering the precise conditions under which this apparently peculiar growth is produced," adds Mr. Sudworth, "as well as the fact that, as far as observed, the adventitious roots proceed only from vigorous, newly formed wood, perhaps these cases may not be more phenomenal than the production of roots from a cutting or from a layered branch, where new wood is subjected to the same conditions, and therefore seem to be quite analogous to the case in which the Linden and Mulberry produced roots, if not an expression of the same law. The apparent incongruity exhibited by a plant deriving, as it seems, nourishment from its own body appears more striking at first thought than if we consider that the lignified part of any living trunk, if reduced by decay, is as fittingly a plant-food as that which may be appropriated by the same individual from its own accumulation of decayed leaves, provided, of course, the necessary moisture is present in the humus."

Catalogues Received.

C. E. ALLEN, Brattleboro, Vt.; Seed and Plant Guide.—GEORGE B. ARNOLD, Benton Centre, Yates Co., N. Y.; Price List of Fruit and Ornamental Trees, Small Fruits and Shrubs.—C. S. CURTICE CO., Portland, N. Y.; Grape Vines and Small Fruit Plants.—J. A. EVERITT, Indianapolis, Ind.; Farm and Garden Tools for Cultivation by Hand Power.—D. M. FERRY & Co., Detroit, Mich.; Flower, Vegetable, Grain and Grass Seeds, Forest Tree and Hedge Seeds.—A. H. GRIESA, Lawrence, Kansas; Wholesale List of Fruit and Ornamental Trees.—PETER HENDERSON & Co., 35 and 37 Cortlandt Street, New York; Water Lilies and Aquatics.—HERBERT A. JACKSON, Successor to THOS. JACKSON, Portland, Me.; Wholesale Catalogue of Deciduous, Evergreen and Fruit Trees, Small Fruits, Vines, Shrubs and Tree Seed.—MCMATH BROS., Onley, Va.; Price List of Fruit, Shade and Ornamental Trees, Shrubs, Small Fruits, Descriptive Price List of Strawberry and Vegetable Plants.—H. MEYER, late WOOLSON & Co., Passaic, N. J.; Hardy Perennial Plants, Bulbs, Ferns and Climbers.—MUNROE, DE FOREST & Co., Successors to MUNROE, JUDSON & STROUP, Oswego, N. Y.; Canada Hard Wood Unleached Ashes.—PITCHER & MANDA, United States Nurseries, Short Hills, N. J.; Catalogue of New and Rare Seeds, Plants and Bulbs, Beautifully Illustrated. Collections of Choice Flower and Select Vegetable Seeds.—GEORGE RICHARDSON, Lordstown, Trumbull Co., Ohio; Rare Water Lilies.—SCHLEGEL & FOTTLER, 26 South Market Street, Boston, Mass.; Vegetable, Grass and Flower Seeds, Hardy Perennial Plants, Large and Small Fruits, Shade Trees.—SHADY HILL NURSERY Co., Cambridge, Mass.; Trees, Shrubs, Vines and Herbaceous Perennials.—J. C. VAUGHAN, 88 State Street, Chicago, Ill.; Garden Seeds and Plants, Tree Seeds.—WEBBER & DON, Successors to A. D. COWAN & Co., 114 Chambers Street, New York; Flower Seeds, Specialties in Vegetable Seeds and Bulbs.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLES:—The Proposed Speed-road in Central Park	109
The Value of a Tree	119
Bright Winter Leaves <i>L. Greenlee</i>	110
Winter Rambles in the Pine-barrens.—III. <i>E. J. Hill</i>	110
<i>Pinus latifolia</i> <i>T. S. Brandegee</i>	111
Seed-raising in Germany <i>George F. Daniels</i>	111
NEW OR LITTLE-KNOWN PLANTS:— <i>Lespedeza bicolor</i> and <i>L. Sieboldi</i> . (With figures.) <i>J. G. Jack</i>	112
FOREIGN CORRESPONDENCE:—London Letter <i>W. Watson</i>	113
CULTURAL DEPARTMENT:—The Winter Garden <i>J. N. Gerard</i>	116
Variiegated Abutilon Eclipse <i>Wm. Tricher</i>	116
<i>Cypripedium Leeanum</i> and Varieties <i>John Weathers</i>	117
Insects in the Soil of Greenhouses <i>John B. Smith</i>	117
Sowing Celery-seed <i>Professor W. F. Massey</i>	117
<i>Aster acris</i> <i>V. C.</i>	117
CORRESPONDENCE:—Constitutional Health of Plants <i>A. W. Pearson</i>	118
The Tan Bark Oak <i>Carl Purdy</i>	118
Help Against the Gypsy Moth <i>Frank H. Nutter</i>	119
EXHIBITIONS:—Orchids at Short Hills, New Jersey	119
Orchids at the Eden Musée	119
NOTES	120
ILLUSTRATIONS:— <i>Lespedeza bicolor</i> , Fig. 18	114
<i>Lespedeza Sieboldi</i> , Fig. 19	115

The Proposed Speed-road in Central Park.

WE sometimes feel like offering an apology to our readers for restating so frequently some of the fundamental principles which should control the design, the development and the management of our city parks if they are to attain their highest possible value. But we are too often reminded that there are many people of intelligence and refinement who seem to have no adequate appreciation of the elementary truths upon which all thought and action in park matters ought to rest. Just now certain wealthy gentlemen of this city have revived the project to run a broad, straight and perfectly level road through Central Park along its western boundary line, to be used exclusively for driving horses at speed; and either they do not understand that this will mean the utter ruin of the park as a place of rural recreation, or, if they do understand this, they consider the use to which they propose to devote it a more important one than that for which it was originally intended.

The primary purpose of the park was clearly discerned when the land was bought. The projectors of the park realized that the growing city was rapidly obliterating every trace of natural scenery from Manhattan Island, and they deemed it a wise and wholesome provision to save a central area where trees and grass and flowers—a picture of pastoral peace—should be preserved as a refreshing antithesis to the rigid lines of stony streets and buildings about it. The city gave bonds to hold it in trust for posterity, and for this single use. It was planned, graded and planted to this end alone. Every road and path and archway was constructed solely to afford the best opportunity for enjoying the beauty, melody and fragrance of a natural landscape. All intelligent men who have given profound thought to this subject are unanimous in their judgment that this was a worthy purpose; that the city did wisely in expending millions of dollars to secure a park designed with such a motive; that, indeed, no city of any pretension, and New York least of all, hemmed in as it is by waters, which

forbid its expansion except to the northward, can afford to be without such a park. And yet these eminent citizens are asking the Legislature to authorize the desolation of a portion of this work, and to insure the final destruction of all of it after millions of dollars and the thought and labor of years have been expended in developing its capabilities. It is even said that one of the Park Commissioners has lent his influence to the movement, although his position is that of a trustee appointed to protect from all such assaults the public property which he seems willing to surrender to its enemies. A Park Commissioner, even if he were empowered to do so by special law, has no more moral right to give over a portion of the park to a use which is not only foreign to its purpose, but utterly destructive of that purpose, than he would have to sell it for building lots.

The promoters of the speed-track urge that paths have been made in the park for visitors to walk in, a bridle-pad for those who ride, carriage-roads for those who drive, and why not, therefore, a special place for those who wish to speed trotters? The obvious answer to this is, that the roads and paths were made not primarily as places for walking or for driving, but in order to enable persons on foot, on horseback or in carriages to enjoy the park itself. That is, the roads and paths exist solely in the interest of the park. The aim of the project in question is just the reverse of this. It is not the construction of another road to open new views or give additional facilities for visiting any portion of the park. It means the destruction of the park in the interest of a road to be used for its own sake by the few people who wish to drive at speed. The principle is utterly vicious. Even if it is the duty of the city to provide a track for the owners of fast horses it does not follow that the park should be sacrificed for it. If the city needs a track for running horses—and if a track for fast driving is provided why not for hard riding and hurdle-jumping—or a military parade-ground, or a field for baseball, football and other athletic sports, the obvious course is to buy the ground and prepare it for these purposes. It would be the work of barbarians to confiscate Central Park for any one or all of these uses, or for any other foreign use, after it has become famous as the most beautiful, and, therefore, the most useful urban park in the world, and the object of our noblest civic pride.

We have become so accustomed to apply the name of park to a ball-field, a race-track, a game-preserve, an arboretum, a forest, a country fair-ground, or any other place that is not roofed over, that the popular notion of the meaning of the word has grown confused, if it ever was distinct. Even intelligent people have to be reminded that many worthy purposes to which open-air resorts can be put would be utterly destructive of the value of a park for rural recreation—that is, the value of a park as a park. It is true that opportunity is offered in Central Park for skating, for lawn-tennis and for some other sports, but these have always been subordinate features—mere incidents which have not been in conflict with the controlling purpose of the work. How far such incidents can be safely multiplied is a matter of judgment; they certainly have never yet been obtrusive or disturbing. Such games are not in themselves inconsistent with the refreshing influence of quiet scenery. No portion of the park has been turned into a desert to make room for them; no grass has been replaced by gravel, nor has any wide swath a mile long been mowed through the trees for them. Every year since the park was designed some class or interest or movement has made an effort to condemn a portion of it to special use; but in the main these assaults have been repelled, and when the power and persistence of this pressure is considered, the salvation of the park—that is, its preservation for its original purpose in ever-growing beauty and value—is something of a marvel.

We have discussed this matter in a general way, presenting only elementary principles which ought to protect a park from invasion of any disturbing character. Perhaps it should be said that this speed-road project is the most

dangerous attack with which the park has been threatened. The most important plantation in it is the tree-border, which, so far as possible, shuts the city out of sight. This project would practically sacrifice the entire border of one side of the park, or it would narrow into pettiness the meadows whose breadth gives the park its essential charm. It would warn out as with a line of fire all visitors from the west side, unless they reached the park through tunnels under the road or by bridges thrown across it. It would make an offensive exhibition of the power of money to confiscate for the pleasure of a few rich men the ground which offers to the poor of the city their only opportunity to enjoy the sight of verdant fields. No one would think of selecting such a site for a speed-road unless he could steal the land. And when the enormous cost of construction through these rugged rocks and ridges is added to the greater loss by destruction which the people of the city would suffer, this would prove the most expensive road in the world. And, after all, it would make only a second-class track, which would be abandoned as a public nuisance within five years after it had been finished.

WHAT is the value of a tree? is a question which has lately been settled in the London courts, as reported in a recent issue of the *Gardeners' Chronicle*. It appears that a resident in the suburbs of London had in his garden two Poplar-trees, which protected him from the smoke and noise of trains passing over the rails of the London and North-western Railway Company, whose location his land joined. The trees, for some reason or other, interfered with the traffic of the railroad; the owner was willing to shorten the branches, but objected to cutting down the trees. And then, negotiations for their removal having failed, the company sent its own men and cut them down. They offered to pay two hundred and fifty dollars for this high-handed act, and later increased the amount to five hundred dollars. The court placed the value of the trees at fifteen hundred dollars, and awarded additional damages of one thousand dollars for the injury caused by their removal. An occasional decision of this character in this country would have a very salutary influence upon telephone and telegraph companies, who have come to look upon our highway trees as of no value whatever when they interfere in any way, directly or indirectly, with their business.

Bright Winter Leaves.

EVEN in our colder northern states nature has some bright color for winter's relief. Against the background of her sombre browns, purplish grays and evergreens gleam out, now and then, scarlet winter fruits and berries, and the shining crimson stems of vigorous young tree-shoots. Traveling southward one finds, interspersed among the open woods, clumps of Holly (*Ilex opaca*) all aglow with clusters of bright berries thickly set among its thorny shield-like leaves, and in the tops of Oak and Gum trees are brilliant green circles of Mistletoe, gemmed with pearl-like berries.

These glints of color, on a level range of vision, the eye quickly takes in, but close down to the forest-leaves at one's feet, the persistent foliage of a number of forest-plants form patches of glowing color quite as cheering to look upon.

Tiarella cordifolia, our dainty little Foam Flower, retains its large, Maple-shaped leaves all winter here in the middle Alleghanies. These leaves all spring in a great tuft from the root, and, ripening into glowing patches of yellow and scarlet, gleam out brightly from rocky eastern hill-sides. I have seen these leaves, still soft and pliant and vivid in color, late in spring, with the delicate sprays of the plant's white flowers above them, before the young season's leaves were sent upward.

Often in the open woods in winter you come upon great beds of *Galax aphyllia* leaves. They are of all colors, from the soft green of their summer hue, shading up through tints of golden green and scarlet and crimson to darkest brown-maroon. These quaintly shaped round-cordate leaves, with their crenate-ruffled edges, are borne upon slender wiry stems six or seven inches high. Their texture is stiff and glossy, and they shine as if varnished, and rustle softly as the wind

sweeps over them. In the sunlight they gleam like a beautiful mosaic.

The leaves of *Asarum Virginicum* are as handsome as those of any *Cyclamen*, and, when bruised, exhale a strange, delightful odor. On exposed, bare hill-sides the cold gives to the thick, leathery leaf a metallic purple lustre, but usually it is bright green mottled with white, like the *Cyclamen*-leaf, which it also resembles in shape and size. A curious little family of pitcher-shaped blossoms may be found clustering close to the earth beneath these leaves in March and February.

A darker leaf, but one quite as beautiful and persistent throughout the winter, is that of the Dye Bush. Its common name was given with reference to the yellow dye extracted from it I am told. But its winter-leaves are a soft, rich purple color, as smooth and pliable as velvet. I have seen the mountaineers bind them upon wounds for healing as they would a salve. The shrub grows only three or four feet tall, and its mantle of purple leaves covers it thickly.

Western North Carolina.

L. Greenlee.

Winter Rambles in the Pine-barrens.—III.

ALLIED to the Alder and Paper Birch, and the only representative of the Sweet-gale family here, is a petty shrub, *Myrica asplenifolia*, or Sweet Fern, found sometimes in the sterile soil. It corresponds in size to the Low Birch (*Betula pumila*), likewise found in neighboring bogs. It is also much like it in color, the bark of the stems being brown, and that of the branches reddish brown. It is a stout little shrub, two or three feet high, with long branches ascending or horizontal, making it tree-like in shape. Its chief attraction now is the prominent, club-shaped tufts of male catkins at the ends of the long branches. They are in clusters of five or six, closely appressed to the branches, often slightly twisted so as to form an imperfect spiral around the branch, and point away from the plant like an outstretched finger. The pointed scales are softly hairy, and, like the ends of the branches, are sprinkled with resinous dots, which shine like flakes of pyrite under a lens, the whole arrangement offering a singular blending of color coming from the brown scales, gray hairs and golden dots. The aments and young branches exhale the same resinous odor that the leaves do in summer, though not as strong, from which agreeable property, and the fern-like appearance of its pinnatifid leaves, it obtains its popular name, Sweet Fern. It is regarded as one of the most characteristic species of the Pine-barren flora, but I do not find it as abundant among the Pines here as it is farther north. In fact, it is more common in the sandy region bordering the Pine-belt than in the Pine-belt proper.

There is an interesting moss-like plant on the sand-hills belonging to the Club Moss family, the little *Selaginella* (*S. rupestris*). It grows in close tufts, rooting in the sand as effectually as it does to the rocks, which are its more common home, and have given it its name. The short, roundish stems, densely clothed with small grayish green leaves, are rigid, and often nearly buried in sand, for the plant delights in exposed positions, not on shifting dunes, but on hills partly overgrown with trees, when it helps to keep the sands in place. It is very different in color and appearance from the flat-stemmed *Selaginellas*, common in cultivation for the decoration of flower-baskets and the edges of flower-pots, one of which, *S. apus*, is found sparingly in the wet sands of this locality.

Two of the true Club Mosses, with evergreen foliage, grow in the Barrens, but are not common. One is the Ground Pine (*Lycopodium obscurum*, var. *dendroideum*), seen in rather moist, shaded ground, with upright shoots half a foot high and closely resembling a miniature tree rising from a creeping subterranean stem. They are always bright and glossy, with thick, lance-linear, incurved leaves closely attached in several ranks to the stems and spreading branches. The erect, club-shaped spikes of fruit, dry and faded, may be seen adhering to the summit of the stems. The other is *L. clavatum*, also known as Ground Pine, but with less of the appearance of a tree, smaller and less striking. The branches are flat and forking and spread like a fan, and are provided with minute awl-shaped leaves. The stems creep extensively, sometimes just beneath the surface of the ground, but more often under a covering of leaves or humus. From these several upright stems, three or four inches high, spring up. The fan-shaped branches may start from these stems in such a way as to assume a spiral or corkscrew appearance as they spread. It is a paler plant than the preceding, lacking its glossiness, but excels it in prettiness when in fruit, with two to four cylindrical spikes borne in an upright cluster at the top of a slender

peduncle. While one resembles the Juniper, but with leaves spreading and incurved, the other has the spray of the *Arbovitæ*.

Another plant of the dry sand-hills will lead one to stop and inspect it when met with in the winter. It is the smallest shrub of the flora of the lake, *Hudsonia tomentosa*. The stem rises but little above the surface of the ground, the whole plant being scarcely more than six or eight inches high, its stem usually bending to one side. It branches so excessively as to have a tuft-like crown. The bark is very dark, almost black, and the branches near their ends and all the twigs are covered with a gray tomentum. When seen in the winter, the plant seems dead and uninviting, the slender twigs so brash as to break square off as if dry, thus adding to the deception. But under a thick covering of hairy scales are the small green buds, and the wood of the fresh fracture shows a green color when closely examined. These tiny shrubs make their home in exposed positions where little else grows, striking their roots firmly in the sand, and the apparently dead tufts, at which the wind tugs hard to draw them from the ground, will be lively in the spring, or early summer, with small but numerous yellow flowers.

Englewood, Chicago, Ill.

E. J. Hill.

Pinus latifolia.

DURING last autumn Mr. S. D. Dill, of the Museum of Natural History of New York, has been collecting sections of western trees in order to complete the well-known Jesup collection of woods, which forms so interesting and instructive a part of the exhibit of that institution, and I had the pleasure of accompanying him on one of his last trips, which was to the Santa Rita Mountains of Arizona, for a log of the little-known *Pinus latifolia*.

This tree was discovered in the Santa Rita Mountains by Dr. Heinrich Mayr in the year 1887, and was described from his notes in this journal (vol. ii., p. 496). In searching for the locality we went first to the town of Crittenden by rail, and thence twenty-five miles to the end of a wagon-road that follows a cañon well into the Santa Rita Mountains. This road formerly extended a mile or more farther up the cañon, but the waters of some rainy seasons have washed out the upper part, rendering it impassable for wagons; nevertheless, we were able to drive to some of the trees we were looking for. At this elevation they are to be found only in shaded cañons; higher up the mountain they are sparsely scattered over all the slopes from near, but not on, their summits, downward a thousand feet or more.

In general appearance this tree closely resembles *P. ponderosa*. It has a similar fissured, reddish bark like that, of variable tone, sometimes lighter, sometimes quite dark; the branches described as tortuous are as often not so, and the cones vary in size and shape. The leaves, variable in length, are generally in threes, although sheaths containing two or four can be found. When they are two, the faces are flat; when three or four, they are at first triangular, becoming gradually flattened, with a distinct midrib. The sheaths of the young leaves are more than an inch long, and decrease in length as they increase in age. The trees had borne no cones for two or three years, but under some of them an abundance of old ones were found. They are always more or less oblique at base, and, with age, seem to fall to pieces from that end, showing at first a stipe-like axis. An extreme form of cone, observed only under a single tree, was very different in appearance from the others. They were slightly unsymmetrical, and the basal scales being detached, the remainder were strongly reflexed, giving to the cones a curiously strong resemblance to the head of an artichoke (*Cynara Scolymus*). Our visit being late in the year (November), after an extremely dry season, when all the leaves of the deciduous bushes and trees had fallen, a great portion of the accompanying vegetation was not specifically recognizable.

Some few plants of *Tagetes* and *Zauschneria* were yet in bloom, and their presence, where at the same time the year before there had been snow, was due to the unusually warm November, so warm that a rattlesnake and a tarantula were seen out in the sunshine. This part of the Santa Rita range was very dry, and water for drinking was found at only one place, and there in small quantity. The mountain is covered with bushes, and in some places there are many trees, especially near the summits and about the shaded slopes. The Oak, represented by five species, is very common, and scattered around are *Garrya*, *Arctostaphylos*, *Fraxinus* and *Ceanothus*, growing among Junipers, Madroñas, Douglas Spruces and several species of Pine.

San Francisco, Cal.

T. S. Brandegee.

Seed-raising in Germany.

MR. GEORGE F. DANIELS, who has spent some years in one of the chief seed-growing centres of Germany, delivered an address last month before the East Anglian Horticultural Club at Norwich. The *Journal of Horticulture* contains a full report of the paper, and from it we make the following extracts:

It is only within the past twenty to thirty years that this trade has assumed its present gigantic proportions. The increased demand for flowers in England has given a corresponding impetus to seed-growing abroad, where they have the advantage of cheap labor and a climate especially adapted to this work. England, next to America, is the largest importer of German-grown flower-seeds. Besides this, large quantities find their way to all parts of the world. The secret of this successful cultivation lies in the bright dry autumn, which enables seeds to stand longer and become thoroughly ripened. Not only is the climate well adapted for the production and ripening of seeds, but the soil, which in Erfurt is a deep, rich and moderately stiff loam, is all that can be desired for the purpose.

Stocks form one of the leading features in a seed-growing establishment, and are one of the most expensive crops to grow, so far as labor is concerned. They are nearly all grown in pots, only the inferior sorts being left to take their chance in the open ground. One firm grows 300,000 pots of these annually. The plants are kept on stages, like an ordinary greenhouse-stage, and the houses have a wooden or tiled roof to keep off the heavy rain and the too direct rays of the sun, the sides and back being left open. The soil used must be well decomposed or "matured," and free from any vegetable matter. Therefore, three years' supply is always kept on hand, and turned, from time to time, to make it sweet. The plants, which are raised in pits on a slight hot-bed, are pricked into six-inch pots, when in the fourth leaf, seven to nine in a pot, so as to throw up single stems only. There are two reasons for this crowding. Seed is only obtained from the single flowers. As soon as the double ones make their appearance the plants are cut off, thus giving more room for those remaining. Placing several in each pot tends to starve the plants somewhat; and when thus treated they produce a larger percentage of double-flowering plants; this has been proved. Seed saved from plants grown in the open ground does not produce anything like the same percentage of double flowers; fifty per cent. is considered a good average, although in some places it ranges as high as sixty-five per cent.

Stocks require a copious supply of water throughout the growing period, which extends from April to October, except for a week or two when they first show their bloom, when it must be sparingly given, as overwatering at this time would cause them to damp off and encourage the attack of insect pests, which are very troublesome at this period. The labor required in constantly watering and tending such an immense number of pots is very great, and keeps up the price of these beautiful annuals.

Autumn Stocks and Wall-flowers require much the same treatment, but in their case a much longer period is required for growing and ripening the seed. The seed is sown in July, and the plants potted in the same way and kept through the winter, a very difficult thing where proper accommodation does not exist, and the thermometer is often several degrees below zero. The larger growers, who have the room, keep them in cool houses; but in small establishments where such is not obtainable, they are kept in pits well covered with litter, air being admitted on fine days. If the winter proves severe, the plants suffer accordingly, as the pits become snowed and frozen for weeks together, and want of air causes many to damp off.

China Asters form another important feature, perhaps even a greater one than Stocks, and are grown by acres, one firm alone devoting over one hundred acres to them. They are raised in pits and afterward planted out on the beds, where it is intended to grow them for seed. The distance they are planted apart varies according to the variety, but is seldom less than a foot each way. The planting is done by gangs of men, much in the same manner as we place our Cabbages, and each plant is carefully watered to settle the soil around it, the water being conveyed to the fields by carts specially constructed for this purpose. When they come into bloom, they must be constantly examined, and all stragglers and "button-eyed" ones removed. The best flowers are selected in March, and the seed of these is kept for stock seed for next year's growing.

Petunias are raised in pits, then potted and placed on stages in the open after the same manner as Stocks. They require

much attention, as each bloom has to be fertilized by hand to insure the setting of seed. The pollen from the double blooms is very difficult to obtain, the flowers being so dense that they have often to be removed from the plant, then placed in wet sand and pulled open so as to allow the sun and the air to ripen the pollen, which is carefully removed and placed on the finest single blooms. The seed saved from these is called double, but it is rarely possible to obtain more than twenty-five to thirty per cent.

Calceolarias are sown in July and August, and after two or three shifts they are finally placed in six-inch pots about the end of January. In May they are arranged upon the stages outside where they are to bloom and seed. They are very shy seeders, and it is only by careful hybridization that a crop can be insured. Every bloom is examined, and the pollen taken from the stamens and placed on the pistil, and as the operation must be performed when the pollen is quite ripe they must be looked through nearly every day to catch each bloom as it comes to maturity.

Carnations are grown on stages, and are usually propagated by layers. A collar or hoop of wood about one and a half or two inches deep is placed round the top of the pot and filled with soil; into this the young shoots are layered, and when sufficiently rooted they are taken off and potted, the hoop and extra soil are then removed, and the mother-plant kept to ripen what seed there may be on it. Seed is very difficult to obtain under any circumstances, and then only in small quantities. The supply is always limited, and there is not much chance of its ever being much cheaper than it now is. In one establishment I visited ten to fifteen thousand pots were kept going for these alone.

The commoner kinds of annuals are grown in quantities. Mignonette and Dianthus are grown by the ton, and a single firm often harvests several hundredweight of Pansy-seed. Pansies require the closest attention, and must be caught at the right time; if not, the pod bursts and the seed is scattered. Some seedsmen grow Everlastings, and reap many acres of them under cultivation. This forms quite a business by itself. They are dried in warehouses specially built for the purpose, and afterward bunched and packed for export.

The pits in which most of the plants are raised are constructed of wood, and are generally not more than nine to eighteen inches high, with the soil cleared out to a depth of about three feet. They are then filled up in the following manner: A layer of rough stalks, then a good layer of fresh manure to within about nine inches of the top, and well trodden down. This is allowed to settle for a day or two, and upon this is placed a layer of fine soil, in which the seedlings are raised.

During summer they are used for growing some of the more tender annuals, such as Cockscombs, Portulacas, etc., so that protection may be given if necessary during cold nights. The soil and manure is removed in the autumn and carefully put away. In this manner it is being utilized while preparing it for future potting operations. They are used in winter for storing Wall-flowers and autumn-sown Stocks, as before mentioned.

The plan of improving stocks of seed is as follows: As soon as the plants are fully in bloom they are carefully examined, and the best and truest as regards color or shapes are singled out by placing a stake next them. When the seed is ripe they are carefully gathered by themselves and kept for stock the following year. This is very necessary in the case of some annuals, which show a great tendency to revert to the wild state, and, at the same time, it improves the stocks from year to year, so that everything is brought as near perfection as possible.

New or Little-known Plants.

Lespedeza bicolor and Lespedeza Sieboldi.

ONE of the most interesting and valuable plants of our comparatively recent introduction is that known in many of our gardens as *Desmodium penduliflorum*, but which, in some places and by a number of writers, has been called *Lespedeza bicolor*, a name apparently belonging to an entirely different plant.

It is unfortunate that neither of these names is correct. It appears that the plant in question, originally described by Miquel in the third volume (p. 47) of the *Annals of the Museum* at Leyden, should be called *L. Sieboldi*, a name generally regarded as a synonym or representing a variety of *L. bicolor*.

*L. bicolor*¹ is a distinctly shrubby species first described in 1840 by the Russian botanist Turczaninow, and first introduced into cultivation by Maximowicz, who, in 1856, sent seed to St. Petersburg from Manchuria, where the plant is indigenous, as it is also in northern China and Japan.

Desmodium penduliflorum was a name given by Professor Oudemans, of Amsterdam, in 1866, to a plant supposed to have come from Japan, and proved by later importation to have been derived from that country.

It was soon widely distributed, on account of its ornamental value; but it was not for some years, or until the name given by Oudemans had become familiar, that this was announced as but another name for *L. bicolor*. The change of name was not generally adopted by nurserymen. Dr. H. Zabel (*Gartenflora*, 1889, p. 239) first called attention to the fact that the plant should be called *L. Sieboldi*, as being distinct from *L. bicolor*. A series of specimens, mostly of *L. bicolor*, from various localities in their native habitats, show that the species are very variable, especially in foliage. While it may be possible, as intimated by Maximowicz, that there are intermediate geographical forms or varieties which connect the two species, they are so distinct when growing side by side that to deny them specific rank must inevitably cause much confusion. In cultivation, *L. Sieboldi* does not prove any more shrubby in southern latitudes than in northern gardens, but it blooms earlier.

Among the published figures and descriptions of these two plants there is naturally some disagreement of identity. The first and best figure of *L. bicolor* is that given by Ruprecht (*Decas Plantarum Amurensium*, 1859, t. 5). The figure in *Gartenflora* (vol. ix., 1860, t. 299), though poor, is probably *L. bicolor*; that in *Flore des Serres* (vol. xxiii., 1869-70, t. 1888-89), as *Desmodium penduliflorum*, is a good representation of *L. Sieboldi*; and so is the excellent figure by Riocreux, opposite p. 211 of the *Revue Horticole* for 1873. What is figured as *L. bicolor* in the *Botanical Magazine*, 1882, t. 6602, unmistakably represents *L. Sieboldi*, although the description appears to have been drawn from *L. bicolor*; and so does figure 133 of vol. xx. (1883) of the *Gardeners' Chronicle*, in which it was published as *Desmodium penduliflorum*, but corrected in the index as *L. bicolor*.

*Lespedeza Sieboldi*² of Miquel is a strong herbaceous, but shrub-like, plant, having numerous stout pithy stems, from three or four to six feet high, which annually die to the ground or crown of the plant, and are replaced by new shoots each season. The stems are more or less ribbed or angled, and covered with a minute grayish pubescence, which is hardly noticeable on the lower portions, but gives them a silvery white appearance near the top.

The leaves are trifoliolate, the terminal leaflet usually being the larger, the leaflets on the lower part of the stem being from one and a half to two inches long, while those on the upper portion and on the branchlets are often reduced to half an inch or less in length. They are smooth above, and are quite densely covered with a minute appressed grayish pubescence beneath, which gives them a silvery aspect. They are usually elliptical-oblong in shape, shortly tapering toward both ends, hardly half as broad as long, and with or without a slender point or mucro at the tip. The petioles are slender, varying from two or three inches with the larger leaves to half an inch or less in length with the smaller. They are more or less covered

¹ *Lespedeza bicolor*, Turczaninow, *Bull. Soc. Nat. Mosc.*, xiv. (1840), 69.—Ruprecht, *Decas Plantarum Amurensium*, 1859, t. 5.—*Gartenflora*, ix. (1860), 270, t. 299.—Maximowicz, *Act. Hort. Petrop.*, ii. (1873), 355.

² *Lespedeza Sieboldi*, Miquel, *Ann. Mus. Bot. Lugd. Bat.*, iii. (1866-67), 47.—Zabel, in *Gartenflora*, 1889, 239.

Desmodium racemosum, Siebold and Zuccarini, *Fl. Jap. Fam. Nat.*, i., 121. (not De Candolle, *Prodr.* ii., 337, teste Maximowicz, *l. c.*)

Desmodium penduliflorum, Oudemans, *Neerland Plantentuin*, ii. (1866).—*Flore des Serres*, xviii. (1869-70), 107, t. 1888-89.—Carrière, *Rev. Hort.*, 1873, 211, and fig.—*Gardeners' Chronicle*, xx. (1883), 749, fig. 133.

Lespedeza bicolor, var. *Sieboldi*, Maximowicz in *Act. Hort. Petrop.*, ii. (1873), 355-357.

L. bicolor, Hooker, *Botanical Magazine*, xxxviii. (1882), t. 6602.—*Am. Ag.* xxxix., 21, f.

D. Japonicum, Hort. ? (not Miquel).

with an extremely minute silky pubescence, and are provided with two slender, long, pointed, awl-shaped stipules at the base. The short petiolules are stouter than the petioles, usually light-colored and densely pubescent.

The large showy cluster of rosy purple flowers which terminates each stem is composed of numerous axillary racemes from two or three to six inches long. The flowers are much larger than those of *L. bicolor*, and average nearly half an inch in length, the wings, standard and keel being of the same general shape, but nearly twice as large. The five-parted calyx is covered with a grayish silky pubescence, and is about one-fourth of an inch long, the narrow slender-pointed lobes being quite twice the length of the shallow tube, at the base of which there are two minute bracteoles. The immature pod is one-seeded, quite densely pubescent, flattish, more or less ovate, from three-eighths to one-half of an inch long, and tipped with a slender tail-like appendage as long or longer than the pod.

Lespedeza bicolor is a single or few-stemmed, well-formed, woody shrub, attaining a height of seven or eight feet or more by rather slow annual growth. The bark of the stem is of a dark brown color, and is covered by numerous raised dots; the young branchlets are distinctly ribbed or angled, are light green or grayish in color, and are very sparsely covered with minute hairs. The outer portion of wood, or the sap-wood, is of a light yellowish color; the interior is brown or purplish brown, and the pith is very small. The wood is brittle, very close-grained and hard. The leaves are trifoliolate, and the leaflets vary in size from an inch and a half or a little more in length on the larger branches to less than half an inch on the flowering branchlets. They are about two-thirds as broad as long, and usually obovate, obcordate, oval or rounded in shape, often tapering somewhat toward the base, but rounding abruptly at the apex, or commonly truncate, retuse or emarginate, and seemingly always terminated by a slender tip or mucro.

The petioles are slender, smooth, varying from two or three inches in length to half an inch or less near the ends of the branches, and provided at the base with two short, comparatively stiff, awl-shaped stipules. The petiolules are thick, short, pubescent, and usually dark-colored.

The large compound racemes of flowers are much less dense and less handsome than those of *L. Sieboldi*; the individual blossoms are appreciably smaller and not generally of such a deep rich color. The calyces are smooth or covered with a short tomentum, and the bracteoles at the base appear less developed than in *L. Sieboldi*. The calyx varies from a sixth to a quarter of an inch in length, the rather obtusely pointed lobes not exceeding the length of the tube. The mature, single-seeded, flattened pod is somewhat pubescent, about one-fourth of an inch long, and a little more than half as broad. The slightly flattish rounded oblong seed is one-eighth of an inch in length and dark brown in color.

At the Arboretum, *L. bicolor*, at ten years from seed and after some annual pruning, is seven or eight feet in height and has single stems from four to six inches in circumference. These divide into several large branches at two or three feet from the ground. In good soil these plants make an annual growth of from a foot and a half to two feet, but the greater half of this growth produces flowers and does not live a second year. They now appear to have about reached their full size and development. As regards their shrubby character, they compare well with any *Colutea* in cultivation here, and, unlike *Colutea*, they do not throw up an indefinite number of stems or suckers.

In this climate the earliest flowers of *L. bicolor* open about the first week of July, and they continue to expand for about a month. The fruit is abundant and ripens early in September, and many of the pods soon fall to the ground, and if the earth is moist or they become slightly covered with soil, the seeds germinate almost immediately without leaving the pods. All the foliage is ripe and falls early in September. This species appears to be rare in cultivation.

L. Sieboldi, on the other hand, is really herbaceous,

although it has a shrubby appearance in its summer vigor and growth. The stems annually die to the ground, and, like an *Asparagus*-plant, they become more numerous each year with the age and size of the root. The first flowers do not appear here until the seed of *L. bicolor* is ripe, and many of the dry leaves remain on the stems until winter. Seed does not ripen here, but plants are easily multiplied by division.

To add to the confusion already mentioned, *L. Sieboldi* has also sometimes been called *Desmodium Japonicum* and *D. racemosum*.

Arnold Arboretum.

J. G. Jack.

Foreign Correspondence.

London Letter.

CYPRIPEDIUM CHAMBERLAINII.—This is a new introduction from the east, probably New Guinea, which Messrs. Sander & Co. have recently flowered, and which has been named in compliment to the Right Honorable Joseph Chamberlain. A figure, representing a portion of the inflorescence, natural size, and a reduced picture of the whole plant, is published in the last *Gardeners' Chronicle*, along with a brief description of the plant by Mr. J. O'Brien. Messrs. Sander & Co. advertise the sale of all the plants by auction on March 4th next. I have not seen any of the living material, but the following particulars are from Mr. Sander's manager:

The plant is a robust grower with exceptionally broad leaves, in some cases fully four inches in width, undulated and tessellated, "remining one of *C. Morganæ*, but larger and finer." The flower-scapes are erect, two feet high, zigzag, and bearing numerous large boat-shaped bracts from base to apex. From each bract a flower springs, possessing scapes, some of which are said to have produced over thirty flowers. These, in color, are said to resemble *C. superbiens* or *C. Morganæ*, but in form they are quite distinct from anything else in the genus. The dorsal sepal is about two inches long and wide, yellowish white with rosy purple lines and spots. The lower sepal is similar, but smaller. The petals are each two inches or more in length, twisted spirally, tomentose and colored yellowish, with a profusion of spots and lines of a purplish color. The lip is as large, and resembles in form the common *C. spectabile* of North America; it is white spotted and shaded with rosy purple on the lower part. There are 700 plants of it advertised for sale. Besides this, at the same sale, will be offered plants of two other new *Cypripediums*—namely, *C. Kimballianum*, described as "a stately species"; the leaves are two feet long. The other has not yet been named, but it is described as having flowers like *C. Wallisi*, with a rose-colored labellum.

CATTELEYA LAWRENCIANA, the beautiful tropical species introduced from Roraima, in British Guiana, a few years ago, was sold in quantity at an auction sale to-day. This region has recently been visited by a collector from Messrs. Charlesworth, Shuttleworth & Co., who, besides the *Cattleya* and several other rare Orchids, also succeeded in bringing home alive several species of *Utricularia*.

UTRICULARIA HUMBOLDTII was among them. It has large peltate leaves and tall scapes, bearing several large blue flowers. Unfortunately, no one who has hitherto attempted the cultivation of this plant in England has succeeded in getting it to flower. It grows naturally in the heart of a large Bromeliad (*Brocchinia cordylinoides*), which always contains a quantity of water in its vase-like centre. But the same kind of treatment fails here; the healthiest plants yet obtained being grown in pans of sphagnum in a sunny tropical house. Thus treated they have made large fleshy tubers and leaves six inches across on stalks a foot high, but, so far, no flowers. Schomburgk, who visited the Roraima in 1845, saw and described this and many other beautiful plants peculiar to that mountain in his delightful book, *Botanical Reminiscences*. Of the *Utricularia* he says: "Here spread before us lay a small marshy



Fig. 18.—*Lespedeza bicolor*.—See page 112.

plain, on which Flora had assembled her most beautiful children, where the charm of flowers had culminated. The whole plain was covered with the dark blue *U. Humboldtii*, the most beautiful species of the genus, with red-tinted flower-stalks from three to four feet high, from which three or four of the curious flowers are suspended. While the amazed

eye was looking upon this charming carpet of flowers it was especially attracted by the interesting and beautiful *Heliamphora nutans*, with light green red-ribbed leaves and bearing slender drooping spikes of white and sometimes red tinged flowers."

Messrs. Veitch & Sons imported plants and seeds of the

Fig. 19.—*Lespedeza Sieboldii*.—See page 112.

Heliophora about ten years ago, but I believe the plants died, and although seedlings were raised they have not grown rapidly. One of them, however, flowered in 1890, and was figured in the *Botanical Magazine* (t. 7093). About a dozen newly imported pieces of the *Heliophora* were sold to-day. It is known as the South American Pitcher-

plant, from its resemblance to the *Sarracenias*, to which it is botanically related. The leaves are folded and horn-like, with an oblique mouth, scarcely any "lid," and when fully grown about a foot in length. The flowers are nodding, not unlike those of an *Anemone*, with scapes a foot long.

SOUTH AFRICAN FRUIT.—Some enterprising people interested in the cultivation of peaches and grapes at the Cape have recently made the experiment of importing the fruit into England at a time when they would be most likely to find a favorable market. The first consignment of peaches was sold by auction last Wednesday in Covent Garden, and realized about twenty-seven shillings per box, some fetching as much as two shillings each fruit. They arrived in splendid condition—so good, indeed, that they might easily have been mistaken for the choicest English-grown fruit. The grapes were a failure, owing, I believe, to faulty packing, and possibly to improper treatment during the voyage. I have seen and eaten grapes and peaches at the Cape, and can testify to their excellence both as regards size, finish and flavor. If the long voyage, partly through the tropics, can be made without injury to the grapes, there is a certain market for them in Europe. The fruit is as easily grown at the Cape as gooseberries are here. Of course, the result of this first experiment need not be taken as final. Even this badly packed consignment of grapes was described as being "large, well-shouldered in bunch, and full in berry." Sold by auction they realized about threepence per pound. The facilities afforded by the very fast steamers of the present time, fitted, too, with the most approved packing and store rooms, render the transport of delicate fruit, flowers and plants from distant countries much easier and cheaper than used to be possible. As a consequence, many islands and other places in the tropics which are favorable to the production of good marketable produce are being seized upon by enterprising people for the growth of fruit, flowers, seeds, etc., to be sold in Europe. The lot of the English growers is yearly becoming harder. All the skill in the world has no chance against the prodigality of nature in the tropics, combined with cheap labor properly guided.

HORTICULTURAL TRAINING.—The editorial comment on what I said with regard to this question (see page 55), namely, that if in addition to practice the pupil is instructed in some of the principles of the sciences related to the art, he ought to be a more intelligent practitioner and a broader man, cannot well be controverted. As a matter of fact this is the principle which is worked upon at Kew. Applicants are expected to take an intelligent interest in the science as well as the art of horticulture; a man who has no desire to know the reason why of his art is scarcely likely ever to rise very high in his profession. But the art, i. e., the practice, is a *sine qua non* in men who are expected to grow plants well. A knowledge of the theory alone would not enable him to do this. Nobody has ever been so foolish as to decry knowledge and thoughtfulness in horticulture. The more the better. But it will be admitted that no amount of book knowledge will enable a man to grow plants well unless he has had a practical training in the art. We only ask that practice shall be placed first; that the clever grower shall get due credit for a knowledge of his art even though he may be ignorant of the scientific principles of that art, and that the best gardener shall be he who does his work best rather than he who can talk most learnedly about it.

London.

W. Watson.

Cultural Department.

The Winter Garden.

IN this latitude the month of January has been one of rather moderate temperature, with no prolonged period of excessive cold and no season of warmth such as is known as the January thaw. In consequence there has been very little movement of vegetation, and even the precocious Chickweed has not as yet shown flower in the garden. However, the garden has at no time been entirely bare of flowers. The autumnal Snowdrops still preserved their forms till early in the new year, when Elwes' Snowdrops began to show color, and stray plants of *Anemone blanda* greeted the lengthening days with their cheerful stars. During February these Snowdrops preserved their purity through all changes of weather, and have been gradually joined by other varieties—*Galanthus plicatus*, *G. Fos-*

teri and *G. umbricus*. Some stray blooms of *Scillas* make dainty spots of blue in the border, and the first of the *reticulata* group of *Irises*, *I. Bakeriana*, has been true to its season. A few warm days will bring forward others of the group, with some varieties of *Anemone*, to be followed soon by the rush of spring flowers.

It may as well be repeated that the flowers named are true winter flowers, and are as well adapted by their structure for their winter environments as any summer flower is adapted to its season. As a matter of fact, if protected from blasting north-west winds, they have an endurance beyond that of most flowers of other seasons. On the 4th of January I noticed the first *Anemone blanda*, which had been encouraged into growth in a warm corner by the edge of a mat overhanging a frame. That same flower, now early in March, opens up its face to the sun every bright day, as pure and unscathed as at first. The *Snowdrop* hides a capacity for heroic endurance under a form of the most captivating fragility and helplessness. The *reticulata* *Irises* vary somewhat, and if the buds are caught in a certain state by an extreme frost they may be injured, but when expanded they endure for a number of days. Over these flowers it is well to secure a sash or some contrivance to throw off wet, but they need no coddling from the cold. At this moment my flowers are under the snow, but the first warm day will reveal them again unsullied and as bright as ever. A succession of *Snowdrops*, *Anemones*, *Scillas*, *Muscari*, *Crocuses*, *Chionodoxas*, *Irises*, *Fritillarias*, *Aconites*, etc., will carry forward the season to the first *Narcissi* and large-flowered bulbs, which later fill the garden with gay blooms. Of course, these small flowers, even in considerable colonies, are not showy, and do not make much impression on the general bareness of the garden, but they are distinctly pleasing and always interesting, and these are qualities we should insist on in a plant as well as in a friend.

One of the pleasures in making a winter and early spring garden is the constant study and experiment required and the difficulty of securing choice material, with the harassing doubt at first as to results. Such a garden is never finished. One gains new points every season to be put on trial, and is pleased if every year shows some slight gain. At present my small bulbs are planted in clumps, with clumps of *Narcissi* for succession. Over all is sown a sprinkling of *Poppy-seed*, for the summer succession. The roots of these latter plants run deep, and should help to keep the ground sweet. It is, of course, a drawback to bulb-culture that beds must be primarily devoted to them, and it is better to suffer the sight of bare earth rather than cover with vegetation which will interfere with the ripening. A bed of this kind is not protected during the winter by any covering, plants of at all doubtful hardiness being in other quarters. Most of these plants are also capital subjects for a cold house. As suggested a few weeks since, a pan of *Snowdrops*, thickly planted, is very attractive, and the plants will be furnished with better foliage than in the open. *Iris reticulata* forces about as readily as any bulbous plant, and its pleasant Violet-like odor is very pronounced under glass. There is much difference in the beauty of the flowers of this *Iris*, those of a reddish cast being not attractive. If one has a cool house from which frost is just excluded, plants of the character under discussion can be grown very effectively and satisfactorily in a rockery, on which can also be arranged some of the small alpine which suffer out-of-doors from the winter rains.

Elizabeth, N. J.

J. N. Gerard.

Variegated *Abutilon Eclipse*.

THIS must not be confused with another *Abutilon* named *Eclipse*, a large variety with green leaves and flowers, orange-colored, veined with crimson and purple. The latter plant is a standard variety in England, though not common in this country. The variegated one is very distinct and beautiful, resembling *A. vexillarium* in type, being of trailing habit and most useful as a pillar-plant for the greenhouse and conservatory. Trained loosely, so as to allow the side branches to droop, it is very effective, as it bloom in the winter, when its graceful branches are loaded with lovely bell-shaped flowers of orange-yellow, with sepals of reddish brown. The leaves are mottled with bright yellow and deep green, and the variegation is most distinct in the winter months when the sun is not so strong, and this makes it more useful.

One of the best modes of culture is to grow it as a standard, using any of the ordinary varieties for stocks, and budding or grafting at the desired height. The stock requires to be grown to a single stem, and kept tied to a straight stick until strong enough to support itself. Two and a half or three feet is tall enough, when the top should be pinched off so as to afford

stiffer and harder growth for budding. This is better done in the spring in a greenhouse, where the plant can be kept in a moderate temperature and partially shaded. If no currents of dry air are admitted—that is, if the house is not too freely ventilated—the buds will “take” in about two weeks. When union is effected, the growth of the stock should be restricted, pinched and kept back, to throw strength into the new growth of the buds, but it should not be stripped of leaves until the buds have made considerable growth, so that the roots are kept active and no check is given the plant. Such plants will make good specimens for the next winter. Eclipse is of better habit than *A. vexillarium* and forms a bushy top. If any shoots are straggling pinch them back, and they will break and become more bushy. The plants may be kept in pots or planted out during the summer and potted in the fall. During the winter months they will produce profusely axillary flowers in clusters to the tips of the branches and make a striking display. The plant is also an excellent one for bedding out, and it makes a good edging to groups of large plants. For baskets or vases it cannot be surpassed. Cuttings of the young wood strike readily at any season. The ordinary soil for greenhouse-plants will answer well for this *Abutilon*. When the pots are full of roots an occasional watering with liquid-manure will prove beneficial.

Dongan Hills, N. Y.

Wm. Tricker.

Cypripedium Leeanum and Varieties.

OF the many fine hybrids which have been obtained artificially by fertilizing one species of *Cypripedium* with the pollen of another the subject of this note is one of the best and most generally useful. There is hardly a flower-show throughout the year, at which it is customary to exhibit Orchids, where *C. Leeanum* is not represented by numerous varieties. This is sufficient evidence of the free-blooming quality of this plant, and the flowers when cut will keep a fortnight.

Like many other fine hybrids, *C. Leeanum* was produced in the nurseries of Messrs. Veitch, of Chelsea, the parents being *C. insigne* and *C. Spicerianum*. The flowers first expanded in January, 1854, and were exhibited at the Royal Horticultural Society in the same month. A glance at the flowers suffices to show that both parents are represented in their offspring, which for size and beauty of color surpasses both. The upper sepal, which possesses the peculiar fan-shaped overhanging properties of *C. Spicerianum*, is almost entirely pure white, with the exception of a bright green blotch at the base, from which radiate upward and outward rows of mauve-purple spots. The lower sepal is much smaller, but still of a fair size, and is pale green with two rows of dark red spots running more than half-way down the inner surface. The petals partake of the characters of those of *C. insigne* and *C. Spicerianum*, the upper margin being for half its distance wavy. The surface is greenish yellow with a conspicuous purple-brown line down the centre, while there are numerous dark spots at the base. The lip is a deep glossy purple-brown, exhibiting a reddish tinge here and there, according as the light strikes it. The incurved lobes, however, are a pale buff-yellow, as is also the large crinkled staminode, in the midst of which is a lemon-colored knob surrounded by numerous minute warts, the tips of which sparkle in the light.

Of the numerous varieties the most worthy of notice are *Superbum*, *Giganteum* and *Masereelianum*. The first is tolerably well known by its large upper sepal and distinct blotches; the second is a still larger form, with the same characteristics, while the third—*Masereelianum*—is the most distinct of all, and may at once be recognized by the conspicuous ivy-green blotch at the base of the upper sepal, which is decorated in the same way, only with larger spots, as the variety *Superbum*.

The same treatment accorded to *C. Spicerianum* will suit *C. Leeanum*.

Islsworth, London.

John Weathers.

Insects in the Soil of Greenhouses.

DURING the present winter much complaint has been made that the soil in many greenhouses is so completely infested by insects that plants fail. This not only in private conservatories, but among gardeners who raise flowers for market and in the forcing-houses of truckers. From a considerable number of samples of soil seen, I find that the insects are nearly always either podurids, maggots or fly larvæ, or myriapods. The podurids are minute insects, usually brown in color, furnished with a pair of anal styles, by means of which they leap about quite actively. They sometimes occur in the soil in perfectly astounding numbers. In one case, where on

a warm sunny day the house was opened, they crowded the surface one-quarter of an inch thick, and about two ounces of specimens were brought me. As the specimens are less than one-sixteenth of an inch in length, and of no perceptible diameter, the number can be only guessed at by millions. These insects feed on decaying vegetable matter in moist, warm places. They are lowly organized, and of a scavenger character. The fly larva was that of a muscid, not one of the root-maggots, and was always associated with rotting manure. The myriapods, finally, were either cylindrical forms like *Iulus*, or somewhat flattened forms like *Polydesmus*, and in all cases lovers of warm moist places, and, normally, feeders on decaying vegetation. These creatures were usually described as wire-worms, while the podurids figured as lice, and much of the failure of plants was charged to them. The podurids and fly larvæ were innocent; but there is good evidence that the myriapods did some gnawing of Rose-roots, and perhaps of those of other plants as well. It will be noted that all of these insects are, primarily, feeders on decaying matter, and this decay is provided in any quantity by the manure used to enrich the soil. This abundant nourishment, combined with an equable warm temperature and a moist atmosphere promoting decay, furnishes ideal surroundings for these insects, and they multiply accordingly. When the soil becomes filled, every injured root and every dying rootlet becomes a point of attack, and they promote decay by keeping bare and irritated every point of injury. The remedy is simple. Apply some of the needed nitrogen in the form of nitrate of soda, and some of the needed potash in the form of kainit. Put the kainit into the ground before you set out your plants, and your nitrate when you want the plants to do best. Both these substances are soluble in water, and can be put into pots in solution. None of the insects mentioned can live in a soil impregnated by these minerals, while as fertilizers they are worth all they cost. In other words, reduce the amount of decaying matter in the soil, and add the needed elements in some directions by using the minerals themselves. It is the salt in its combination in the nitrate and kainit that has the insecticide effect; but common salt is not as effective in the form in which the chloride is combined as it is in the kainit.

Rutgers College.

John B. Smith.

Sowing Celery-seed.

MANY amateur gardeners have so much difficulty in getting a good germination of Celery-seed that they have abandoned the effort and buy their plants.

This may be the best course when only a few plants are wanted, but it is easy to get the plants from seed with proper treatment. My plan, which has never failed, even in hot-weather sowing, which is essential here, where early sown plants would run to seed in fall, is as follows: Celery-seed, being quite small and their first growth delicate, will not bear heavy covering of earth, and a light cover in our brilliant sunshine soon becomes so dry that germination is retarded; I therefore sow on a well-prepared border on the north side of a board-fence. The rows are barely traced across the bed, and the seed scattered thinly on the lines. The whole bed is then beaten over with the back of the spade, which gives sufficient cover. I then cover the surface with old gummy sacks or cotton baling. This prevents the drying of the surface and insures a uniform germination. As soon as the seeds sprout the cover is raised on sticks and gradually removed as they show green leaves and can bear exposure to the light.

As soon as the plants are large enough to handle easily I transplant them to a cold frame and cover the frame, in lieu of sashes, with screens made of laths tacked an inch apart. This gives a varying shade, and the plants thrive wonderfully and will need to have their tops sheared once or twice before final transplanting.

The time for sowing the main, or winter, crop would be late in March in latitude of New York, and in late May in North Carolina, and the final transplanting in July and September respectively.

Raleigh, N. C.

W. F. Massey.

Aster acris.—This is one of the most useful of the dwarf forms of perennial Aster, or Michaelmas Daisy. It is a delightful plant to produce a gay mass of color, and should be used freely to color the garden-scenery in the fall months. The habit of the plant is quite dwarf, and even in rich soil the growth does not rise more than two and a half feet, the leafage in the autumn, from the middle of September until early October, being hidden beneath the mass of light purple flowers. I have seen this variety produce beautiful pictures in the

autumn, and associates well with the early-blooming section of *Chrysanthemums* best represented by the variety *Madame Desgranges*, the Daisy forming the outer ring to the bed, the centre filled up with the *Chrysanthemum*. Both grow freely in ordinary soil.

Kew.

V. C.

Correspondence.

Constitutional Health of Plants.

To the Editor of GARDEN AND FOREST:

Sir,—Observing the growths of the various plants we notice that some of them are unthrifty, and when closely inspected we find them infested by microscopic parasites. Other plants we see preyed upon by insects, which, like the fungi, eat the substance of the plant. We may also notice other plants, growing under apparently similar conditions, but free from fungus or insect, and apparently healthy in the midst of pestilential influences.

Fungi and insects evidently choose their food, and where there is a choice of adaptable foods they often show a decided preference. The potato-beetle feeds upon the Egg-plant, the Tomato-plant and the Potato-plant, but, where all of these are equally accessible, the Potato-plant will be chosen the first. The rose-bug feeds upon all sorts of Grape-vines, but it prefers those containing the blood of *Vitis riparia*, and where it finds some of these vines in the vineyard it will feed chiefly upon them, nor eat of other vines until these are devoured. Hence viticulturists advise the interspersing of a few *Riparia*-vines in the vineyard to attract this insect from other varieties.

Just as higher plants refuse to grow in some soils and thrive in others, fungi show their preferences for one or another host-plant. The black rot of the Grape infests almost all varieties of the vine, yet among them the omnipresent spores of this parasite manifest this elective affinity in a remarkable way. For example, in ordinary seasons favorable to thrift of the vine and unfavorable to activity of this fungus, the Ives are comparatively exempt from attacks of this so-called disease. Yet vineyards of the Ives are sometimes ravaged by the black rot, proving that this variety of *Vitis Labrusca* is not specifically resistant to the fungus. But in the behavior of the fungus with relation to this vine we have interesting proof of the action of those subtle preferences, already alluded to as elective affinities. In 1873, when the grape rot first became severely epidemic in southern New Jersey, I noticed in one of my vineyards a few Ives Grape-vines free from the disease, while surrounding Concords were all rotting. Soon afterward, in a report from the state of Illinois, I was informed that "the Ives grape does not rot." I then procured Ives vines, and in a small vineyard of five hundred Concords, set twelve feet apart along the rows, I planted Ives vines intermediately with the Concords, purposing, if the latter proved unsatisfactory, finally to extirpate them. At the same time I planted another vineyard of two thousand Ives vines. All of these vines, Ives and Concord, came in fruit together. Grape rot was epidemic, and destructive to the Concord. In the vineyard of mixed Ives and Concord the latter all rotted, while the Ives grapes did not rot at all. The vines of both sorts interlaced on the trellis, and here were clusters of Concord totally ruined by rot, while among them, and almost touching them, were clusters of Ives completely healthy. In this mixed vineyard this phenomenon of diseased Concords and healthy Ives has been yearly manifest.

On the other hand, in the vineyard where two thousand Ives are planted by themselves, there is yearly more or less of grape rot, appearing sporadically, but never so badly as on Concord-vines. When this Ives vineyard was planted, a few vines failed to grow; these were replaced by Concords. When the latter came in fruit the rot took full possession of them, while the Ives growing nearest to the rotting Concords were the healthiest of any of the Ives-vines in the vineyard. It looked almost as if the germs of the rot fungus were endowed with the power of motion, and had abandoned the Ives vines to feed upon the Concords.

Certainly each minute organism has its own peculiar way of propagating its species, and in getting a living makes choice of congenial foods. Now, since this choice of food is directed by some peculiar quality in the juices or tissue of the plant which are attractive to these devourers, or else repellent to them, it may be possible by an enlightened use of special fertilization, or by medication, to influence or modify the qualities of cultivated plants, so as to render them unattractive to these aggressors. Why is it impossible for science to discover prophylactics for the diseases of plants as it has done for contagious diseases of animals? Such prophylactics might be adminis-

tered through the natural channels of absorption with plant-food. Or if the subtle germ or virus productive of disease can be transmitted from plant to plant by inoculation, as in the case of Peach yellow, perhaps the antidotes (when we discover them) may be also thus applied.

Experience shows that plants stimulated into vigorous growth by special fertilizers are often peculiarly exempt from the attacks of insects and of fungi. Evidently, there is that in the juices of such plants which does not please their taste. I planted some Potatoes on poor soil, where they made but feeble growth. Near this plot was one planted with similar Potatoes, fully fertilized, and stimulated by nitrogenous manures. The weak plants on the poor soil were attacked by the beetle and devoured before the strong plants were touched. This is ordinarily explained by saying that the fertilized plant grows faster than the bug can eat it; but, in fact, the beetles did not visit these plants. When they had consumed the plot of weaker plants they sought other fields of similarly starved Potatoes and ate these in preference.

These two Potato-plots also showed a remarkable contrast in resistance to the Potato-blight, which, when it became epidemic, attacked the weaker ones first and totally killed them. The stronger plants were blighted later, but the leaves only were harmed. The stalks were unaffected, and, after the foliage perished under the fungus, they put forth a new growth, which endured until frost, maturing a crop of tubers. Evidently, fertilization promotes the health of the Potato-plant, and enables it to resist some diseases. There is reason to hope that when we shall have learned how to feed the plant with all of the requisites to health, we may secure more complete exemption from contagious disease.

Vineland, N. J.

A. W. Pearson.

The Tan Bark Oak.

To the Editor of GARDEN AND FOREST:

Sir,—Among Californian Oaks, and there are many, none are more beautiful than *Quercus densiflora*. It is an evergreen, and forms in appearance a connecting link between the Oak and the Chestnut. The leaves, elliptical in outline, light green above and fuzzy beneath, are shed in summer. In July it blossoms, and the very fetid odor of the flowers is the one disagreeable trait of this fine tree. It bears a true acorn, oblong in shape, set in a shallow cup, which, on account of long, slender light green scales, seems moss-covered. The bark is thick and rough, exceedingly rich in tannin. The wood is straight-grained and tough, excellent for fuel, and will, in all probability, be found valuable to the wood-worker. It ranges from Monterey County north to Mount Shasta, in the Coast-range of California, being pretty closely confined to the Redwood belt. At Mount Shasta it grows as a bush five to eight feet high, covering considerable areas.

It is in the Redwood region that it attains its greatest perfection, and it is everywhere a tree of the mountains. On the open ridges the Tan Bark Oak is a great spreading tree, frequently three feet in diameter and fifty in height.

The dense shade of the Redwood forest forces every tree to grow up for light and air, and in such situations this Oak grows as erect as a Pine, almost bare of branches for two-thirds its height, seldom over two feet in diameter and frequently sixty to eighty in height.

It is on the eastern or interior edge of the Redwood belt that it is most abundant, forming the principal growth on the ridges, and preponderating on the upper slopes. Its commercial value is great, and the demand so much that it is now being hauled by wagon twenty to thirty miles over rough mountain-roads to reach the railroads or sea-coast, and large areas are stripped annually. Nearly all of these mountain-roads follow the ridges, enabling the bark-peelers to secure the bark readily along not only the main ridges, but the laterals.

The workers, with their families, move out into the woods for the summer. A Redwood is cut, and the lumber split out for the cabins, sheds, stables, and even the board chimneys. A few lengths of one of these big trees will split into enough lumber to build quite a settlement. The Oaks are cut close to the ground, and the bark scored off into four-foot lengths. It is then peeled and thrown down to dry. When dry it rolls. The hill-sides are very steep, and to get this bark to the wood-roads hand-sleds are used. In some places where wood-roads would be expensive, pack-mules have been used.

Nothing but the bark is used, and after the peelers have gone through a maze of trunk and branch covers the ground, to rot or be burned by the next forest-fire. Of course, the wood is used for fuel in some few places accessible to shipping-points, but it may be said safely that not one-tenth is so

used. When a fire sweeps through this mass of dry material it burns with a heat that kills small standing trees. In peeling the methods are wasteful, and very often a tree may be seen that some lazy peeler has girdled by taking a four-foot section of bark from the base. The Tan Bark Oak is tenacious of life, and sprouts vigorously, but the odds are against it, and it seems as if in a few years this fine growth, whose future value, on even a cord-wood basis, would be immense, will be destroyed to secure a few lengths of bark from each tree.

Ukiah, Cal.

Carl Purdy.

Help Against the Gypsy Moth.

To the Editor of GARDEN AND FOREST :

Sir,—In view of the success which has apparently crowned the efforts of the Orange culturists of California in "fighting fire with fire," or rather insect with insect, and, calling to mind the warfare which is being waged in the vicinity of Boston with the Gypsy Moth, I was struck with a passage I was reading to-day in a little book entitled *The Branch Builders*, by the late Rev. J. G. Wood, which, if my memory is not at fault, is a reprint of a portion of his better-known work, *Homes without Hands*, and which may perhaps suggest a new method of meeting the invader.

In treating of the habits of an English species akin to our tent-caterpillar, he speaks of a carnivorous beetle, the larvæ of which are often found in the nests of this pest, and which feeds voraciously on the caterpillar. The scientific name of this beetle he gives as *Calosoma sycophanta*.

The following extract will show its connection with the case in hand :

"Knowing the habits of this grub, a French entomologist, Monsieur Boisgerard, managed very ingeniously to avail himself of its devouring capacities. There is a well-known insect, the Gypsy Moth, which is very common in France. The larvæ of this moth are destructive to trees, feeding on their leaves, and then retreating to a hiding-place in some crevice of the bark. Finding his trees infested with these caterpillars, Monsieur Boisgerard procured a number of female *Calosomas*, and placed them on the trees. They laid their eggs, and in due season the larvæ were hatched. In process of time the destructive grubs increased so much that they ate all the noxious caterpillars, and at the end of the third year the trees were cleared, and the *Calosoma* beetles had to go elsewhere for a living."

"In England the *Calosoma* is very rare," but "in the south of France it is plentiful enough, as is needed from the enormous multitudes of crop-destroying caterpillars on which it feeds."

This plan may already have been tried or investigated, but if not, it seems to me worthy of consideration, though I am aware that the introduction of foreign species of animals is not to be lightly entered into; witness, the English sparrow and the rabbits of Australia.

Minneapolis, Minn.

Frank H. Nutter.

[There is no doubt that certain ground-beetle larvæ feed upon hairy caterpillars, and the observation mentioned is correct. Professor Riley writes that he has for some time been urging the Gypsy Moth Commission to send an agent abroad to collect the European enemies of that insect, and it is to be hoped that this will soon be done.—ED.]

Exhibitions.

Orchids at Short Hills, New Jersey.

THE exhibition at the United States Nurseries, to which Messrs. Pitcher & Manda invited the public last week, surpassed in richness of material and effectiveness of arrangement any of the previous efforts of the firm. The main display was arranged in the great Palm-house, 250 feet long and high enough to accommodate superb specimens of Tree Ferns and Palms. The visitor entered the house through a vestibule flanked by tall Laurels and *Cytisus* in bloom, with the clear golden yellow of *Doronicums* on either side of the doorway. Inside the door there seemed to stretch away to an interminable distance a tropical forest, with its shady vistas brightened by the flowers of thousands of Orchids, not crowded together, but naturally and effectively placed where their soft harmonies and contrasts would make the most pleasing picture. On either side of this long house, and opening into it at right angles, were other houses, making altogether a cluster of twenty, each one of which was a study. One of them, for example,

was entirely filled with *Areca lutescens*; a second with *Adiantums*; a third with *Pandanus*, and a fourth with *Phoenix*. *Dra-cænas* filled another, and *Areca Baueri* another still; and one which contained nothing but *Anthuriums* and *Bromeliads* faced another filled with *Kentias* and *Cocos*.

It would be useless to attempt a description of all the rare and beautiful Orchids that were scattered among the greenery of the great house. To name them even would be a task, as the list would include most of the principal species and varieties in flower at this season which are prized in the great collections of the world. There were some 3,000 plants in bloom. But among those which were particularly attractive we noted a vigorous specimen of the white *Cœlogyne cristata*. Near it was the dainty little *Epidendrum Endresi*, and farther on were the long white and fragrant spikes of *Dendrochilum gluma-ceum*. On a stage about a huge *Chamærops* were grouped fifteen specimens of the white *Lycaste Skinneri*, and fifty of these snowy flowers are not often seen together. Among the *Dendrobiums* was a strong plant of *D. splendidissimum grandiflorum*, and suspended from one of the Palms was as fine a piece of *Angræcum sesquipedale* as we have ever seen, with its deep waxy cream-colored blossoms. Among the most interesting of the different varieties of *Cattleya Trianae* was Lee's variety, not only rare, but wonderful for the depth and richness of its color. *C. speciosissima* was represented by a variety remarkable for its size and for the delicacy of its pale lilac blossoms. An interesting place to linger was among the many distinct varieties of *Odontoglossum crispum*, and near these was a plant of *O. Rukerianum* with two large spikes and fifty flowers.

One of the houses opening into the Palm-house was full of *Cypripediums*, which occupied both the centre stage and side benches, with no plants among them except small *Araucarias* and one row of tall ones in the centre to soften the color. There were one hundred and twenty-six varieties here in bloom, and more than five hundred plants. They were all seen to good advantage, as the plants were separated by the soft green foliage of the *Araucarias*. Perhaps the experts in *Cypripediums* would find the greatest delight in such specimens as one of *Cypripedium Sallieri Heyanum*, which was offered at \$800, or another of *C. pavoninum*, or a third of *C. Germinyanum*. But besides such varieties were beautiful specimens of *C. villosum* and other standard species in almost infinite variety. Among the new hybrids in bloom was one named *Beatrice*, a cross between *C. Boxalii* and *C. Lowii*, and another between *C. venustum* and a form of *C. insigne*. *C. Lindleyanum* was represented by an admirable plant with a spike more than three feet long.

Of course, the Orchids were the chief attraction, but the house which was filled with *Azaleas*, *Cytisus* and bulbous plants in bloom was exceedingly bright in color, and the single block of houses massed on this part of the grounds had plants enough to keep one occupied a day if he gave them more than a cursory examination. After all, the most interesting exhibition at Short Hills is the order and cleanliness and good taste shown throughout all of the fifty houses now in operation. The great stretches of plants in every stage of growth, from the tender seedling up to the display specimens, all show good health and careful cultivation, while all the operations and processes of the immense establishment move on with apparent smoothness and ease. Of Orchids alone there are said to be here some 1,200 distinct species and botanical varieties, at least 400 horticultural varieties, and perhaps as many artificial hybrids. There are 3,000 seedlings growing, some of them hybrids between different genera.

Orchids at the Eden Musée.

FOR the sixth year in succession Messrs. Siebrecht & Wadley have held an exhibition of Orchids and other tropical plants at the Eden Musée, in this city. The chief interest of the exhibition, as usual, centred in the Orchids, which were shown in considerable variety, but first-rate specimens of Palms, Cycads, Tree Ferns and other rare and valuable tropical plants were also displayed. Many of these last were said to have been lately brought from Trinidad, where there is a branch of the Rose Hill Nurseries, in which tropical plants are produced in large quantities. The plants were arranged with good taste, especially the curtain of greenery which masked the front of the balcony. One of the most interesting Orchids in Messrs. Siebrecht & Wadley's collection was a new form of *Cattleya labiata* which had a larger lip, a deeper color, and was altogether of thicker texture than the original type. There were good plants of *Cattleya splendidissima*, *C. Schroederæ* and *C. Aspasia*, and many other choice forms of *C.*

Trianae. *Cymbidium Lowii* was represented by some well-grown specimens.

Mr. W. S. Kimball, of Rochester, had a remarkable group of Cypripediums, among them being fine examples of *C. Argus*, *C. Boxallii atratum*, *C. Calurum*, *C. Winnianum*, and fifty others. The new variety, *C. Lathamianum*, was seen for the first time by a good many visitors. Mr. F. H. Goodrich also showed some admirable specimen plants, one of *Odontoglossum grande* attracting the most attention. The collection of Mr. Hicks Arnold was represented by a magnificent spike of *Dendrobium Phalaenopsis Schroederianum*, blooms of *Cypripedium microchilum*, *C. Lathamianum*, and many other choice species. Mention should also be made of a wonderful specimen of the true *Cattleya Trianae alba*, the genuine snow-white form, which is so rarely seen. Apart from the Orchids, two magnificent plants of *Licuala grandis* and some admirable *Crotons* were the most attractive things in the exhibition.

Since the last exhibition some changes have been made in the hall, and they do not seem to have improved it as a place for displaying plants and flowers to the best advantage. It was a misfortune, too, that the proprietors of the Eden Musée were unable or unwilling to furnish a better light in the evening. When the owners of fine plants go to the trouble and expense of transporting them a long distance, besides sending competent persons to superintend their arrangement, it is worse than annoying to have their beauty hidden in darkness.

Notes.

Mr. John N. May writes to the *American Florist* that throughout the entire eastern section of the country there is complaint that Roses are not producing as well as usual this year.

The third southern California Citrus Fair, now open in Los Angeles, is said to surpass all its predecessors in variety and beauty of exhibits. Tourists who may be passing through Los Angeles are advised by a correspondent of *The Tribune* to see this fair, as it demonstrates the important work being done for the improvement of oranges and lemons. One of the features of the display is the new seedless lemon, which promises to rival in popularity the navel orange.

Number 2,000 of the *Gardeners' Magazine*, its issue for February 27th, has just been received. This journal was started on the 1st of March, 1833, as a sixpenny monthly, under the name of the *Floricultural Cabinet*, by Mr. Joseph Harrison. His sons carried on the paper until 1859, when it was changed to a weekly under its present title. In 1861 Mr. Shirley Hibberd became its editor, and continued to occupy that post until his death, in November, 1890. Mr. Hibberd was succeeded by Mr. George Gordon, who was associated with him in the literary management of the paper for many years. A horticultural journal, with an honorable history of nearly sixty years behind it, is worthy of respect, and deserves the best wishes of all lovers of the art which it represents.

The bill to incorporate the Yellowstone Park Company, to which editorial allusion was made in last week's issue, was referred to Secretary Noble for his opinion, and he has sent to the chairman of the committee which holds the bill an energetic protest against it. After criticising it in detail, he characterizes it as opposed to the public good, for private interests solely, and in every way pernicious. He expresses the opinion that, in view of the growing interest in the park, the Government should strengthen its control over it rather than substitute a corporation in its place and compel the people to feel at every stage of progress amid these wonders that they are there to help a private enterprise rather than to enjoy their own under the control and responsibility of the National Government.

On the German seed-farms labor is very cheap. The average wages of a workingman is from seven to nine shillings a week, and for this he works from five in the morning to seven in the evening, and in winter one hour less, commencing at six instead of five. In summer the hands are employed in the seed-grounds, and during the winter months in the warehouses cleaning and dressing seeds. Much of the lighter field work, such as hoeing, cleaning and gathering seed, is done by women and girls, who work in gangs under the charge of a foreman. They are very expert in the use of the hoe, and get over nearly as much ground as a man. They earn from tenpence to one shilling per day, and many have to walk several miles to and from work, as the majority live in the surrounding villages.

Mr. J. M. Samuels, Chief of the Department of Horticulture for the Columbian Fair, writes to the press that P. S. Peterson,

a nurseryman of Rose Hill, Chicago, has during the past week planted six trees on the grounds near the horticultural building, as a permanent exhibit, and as a practical illustration of the successful methods of transplanting large ornamental trees. They are an Elm, fifty feet high and two feet in diameter, brought from the woods in 1876, when fifty years old, and planted on the nursery grounds at Rose Hill; a Hackberry, forty feet high and two feet in diameter, also transplanted from the woods in 1876; a Linden, forty feet high and a trunk eighteen inches through; a Willow, thirty feet high and thirty feet spread; a Sugar Maple, forty feet high; an Ash, thirty-five feet high. It required a force of twenty-two men and twelve horses to transplant the trees, and the cost of the work was about \$700.

Surprise is expressed in *Meehans' Monthly* that the English Heath is not more generally cultivated in the United States. It has been in prominent American nursery catalogues for many years, but the demand for it is small, because people do not know that it may be cultivated readily. The great enemy to it is the sun when the thermometer is very low. It would grow near the North Pole, with a light covering of leaves, snow or anything that would protect it from the sun. It will not grow in heavy clay or in any soil where the earth packs closely together, as the small hair-like roots cannot penetrate this stiff matrix; but wherever the soil is sandy, gravelly, or in any way so constituted that the little roots can push freely, it grows well. It is a good plan to enclose a plant in a four-sided frame, such as a soap-box without a bottom, and fill in three to four inches of sand so that it gets in among the lower branches. The plant seems to thrive even better under such circumstances than on its native heaths.

"There are certain flowers," says Mr. Conder in his book on Japanese flowers, "which bloom twice in the same year. These are technically called Returning Flowers. Though considered unsuitable for ordinary occasions, because out of harmony with the season, such flowers are especially appropriate for farewell gatherings. The idea in so employing them is to express the hope for a safe return. . . . Flowers placed before sick persons should be put together in a rapid and unlabored manner, and should be vigorous in style, to suggest the idea of recovery and strength. At the ceremony of praying for the sick flower-compositions should be full and gay, as well as bold and powerful in style. . . . As it is the east wind which brings rain, floral arrangements used at time of praying for rain should have their principal line pointing from right to left, to suggest the east wind blowing; a reverse arrangement is resorted to on occasions of prayer for fine weather, when the principal line, leaning from left to right, is made to suggest the west wind.

Among the investigations of timber undertaken by the Department of Agriculture was a series of tests to determine the effect of gathering resin from Long-leaf Pine upon the strength of the timber. It has been believed that timber from trees which have been "boxed," sometimes known as "Turpentine timber," loses both durability and strength. There can be little doubt that the withdrawal of the resin, which keeps out water, and has apparently some antiseptic qualities, does reduce the capacity of the timber to withstand rot. But the tests so far carried on seem to indicate that turpentine timber possesses greater strength than that from unboxed trees. Of course, this result is not to be accepted without further verification, but the matter has seemed to Mr. Fernow of sufficient importance to justify a circular giving the conclusions of Professor J. B. Johnson, who is conducting the experiments at St. Louis. In a general way these conclusions are that turpentine timber exhibits less tensile and shearing strength, but it is stiffer and has greater compressive strength endwise and greater cross-breaking strength. The turpentine timber proved harder to work, however, since the resin seemed to be collected in spots, and gummed up the tools.

Catalogues Received.

BULB GROWERS' ASSOCIATION, Bayonne, N. J.; Price-list of Summer-flowering bulbs and Seeds.—CHIPMAN BROTHERS, Sandwich, Cape Cod, Mass.; The Cape Cod Pond Lily.—M. CRAWFORD, Cuyahoga Falls, O.; New Strawberries.—EMERSON, SMITH & Co., Beaver Falls, Pa.; Saws.—FRED. W. KELSEY, 145 Broadway, New York; Choice Hardy Trees and Plants.—E. W. REID, Bridgeport, O.; "Everything for the Fruit Grower," Price-list of Select and Tested Seeds.—J. C. VAUGHAN, Chicago, Ill.; Trade-list for Florists.—JAS. E. WARNER, 19 Park Place, New York; The Thermo-static Incubator.—H. W. WILLIAMS & SONS, Batavia, Ill.; Tree and Plant Labels, Transplanting Boxes and other Supplies for Nurserymen and Florists.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLES:—Serenio Watson.....	121
The Golden-leaved Oak of California. (With figure.).....	121
Suitable Names for Country Places.....	Mrs. J. H. Robbins. 122
Notes of a Summer Journey in Europe.—IX.....	J. G. Jack. 123
Notes in the Woods.....	T. H. Hoskins, M.D. 125
CULTURAL DEPARTMENT:—Housetop Gardens.....	E. P. Powell. 125
Roses.....	W. H. Taplin. 126
Bulbous Plants in Winter.....	J. N. Gerard. 126
Sowing Beets and Radishes.....	Professor W. F. Massey. 128
Brodisea (Triteleia) uniflora.....	M. Barber. 128
Crandall's Currant.....	E. P. P. 128
ORCHID NOTES:—Orchids at North Easton, Massachusetts.....	A. Dimmock. 128
Orchids in Flower in New York City.....	D. 129
CORRESPONDENCE:—A Small Conservatory.....	John Chamberlin. 129
The Constitutional Health of Plants.—II.....	A. W. Pearson. 130
The Danger of Delay in Acquiring Land for Public Use,	
Apples for the North-west.....	H. W. S. Cleveland. 131
Notes.....	George F. Kellogg. 131
ILLUSTRATION:—The Golden-leaved Oak (Quercus chrysolepis) on the high	
Sierra Nevada, Fig. 20.....	127

Serenio Watson.

SERENIO WATSON, the Curator of the Herbarium of Harvard College, a man of high character and sound learning, and since the death of Asa Gray the foremost systematic botanist in America, died at his home in Cambridge on the 9th instant after a long and painful illness. He was born on the 1st of December, 1826, at East Windsor Hill, Connecticut, one of the youngest of a large family, and graduated in 1847 from Yale College; then, having taught school for several years in different states, he studied medicine at the University of New York, and later, with an older brother, established as a physician at Quincy, Illinois. He practiced his profession for two years, and then abandoned it to become Secretary of the Planters' Insurance Company of Greenboro', Alabama, a position which he occupied from 1856 to 1861. It was at this time that Mr. Watson began seriously to study plants, although it was not until seven years later, after a term in the Sheffield Scientific School, that he became a professional botanist. He was in California in 1868, and sought and obtained the position of botanist to the United States Geological Expedition, which, under the leadership of Clarence King, explored the territory in western America adjacent to the fortieth parallel of latitude. He was engaged in field-work principally in central Nevada and Utah during the seasons of 1868 and 1869, and published in 1871, with the aid of Professor Eaton, the results of his investigations of the flora of the Great Basin, his report forming the fifth volume of King's *Report of the Geological Exploration of the Fortieth Parallel*. Watson was now invited by Professor Gray to become his assistant at Cambridge, and the remainder of his life has been devoted to the study of the flora of North America and to the care and improvement of the Gray Herbarium and Library.

His publications since his connection with Harvard College have been important; they consist of *The Botany of California*, in connection with Professor Wm. H. Brewer and several specialists; of eighteen numbers of *Contributions to North American Botany*, chiefly published in the

Proceedings of the American Academy of Arts and Science, and containing the descriptions of many new species of plants and the elaboration of various groups and genera; and of the first part of the *Bibliographical Index to North American Botany*, a most useful work of much research and learning, in which are cited the authorities for all American plants, with a chronological arrangement of their synonymy. Mr. Watson edited the unpublished work on North American Mosses of Lesquereux and James, and more recently, with Professor Coulter, a new edition of Gray's *Manual of the Botany of the United States*. He was a valued contributor to the columns of this journal, and the earlier volumes contain his descriptions of many new and interesting plants. On the death of Professor Gray, four years ago, Mr. Watson was made curator of the Gray Herbarium and Library, and the last years of his life have been spent in administering these great collections, which make Harvard one of the important centres of botanical research.

Mr. Watson was a silent man, retiring and self-contained, always genial and kind, of marvelous capacity for sustained labor, and untiring in helping others. This is not the occasion to discuss his position among the botanists of the period; and just now our thoughts are full of the man, the old and trusted friend and associate, whose death takes from us the example and inspiration of a modest and well-spent life of noble endeavor and useful labor.

The Golden-leaved Oak of California.

THE great forests of California, those that clothe the slopes of the mountain-ranges, which extend in parallel lines through the state from its northern boundary, where the two mountain systems are joined by cross-ranges, almost to its southern limits, are chiefly composed of coniferous trees—Pines, Firs, Spruces and Sequoias; and these so predominate that the facts are often overlooked that within the borders of the state are found some of the noblest broad-leaved trees which grow outside the tropics, and that California is the home of the handsomest and the largest, if not the most valuable, Oaks of the New World. They make the valleys parks, dot the low foot-hills and climb high up the mountain-sides; some retain their foliage for more than a year, and others renew it every spring; some are great trees and others are little shrubs; sometimes an individual of a species attains enormous dimensions, and sometimes under different conditions of environment another individual of the same species is only able to raise a few stunted stems a foot or two from the ground. On certain individuals of some species the leaves are entire, and on others as spiny as a leaf of the Holly-tree, or sometimes the leaves of the two forms appear side by side on the same branch. It is not surprising, therefore, that the student of trees is perplexed when he finds himself confronted with some of the California Oaks; or that every botanist who has paid attention to them has reached different conclusions with regard to the characters to be relied on to unite the different forms into specific groups.

A few of these western Oaks recall some of our familiar Oaks of the east; two species of the north may well be descended from the ancestor of our eastern White Oak and of our Post Oak; and the Black Oak of the western slopes of the Sierra Nevada, in foliage at least, is much like our common Quercitron Oak; but most of the California Oaks are of Mexican and Central American types. The most curious of them all to eastern eyes, save only the Tan Bark Oak (*Quercus densiflora*), which is almost as much a Chestnut as an Oak, and of an Asiatic rather than of an American race, is the Mountain Live Oak or Golden-leaved Oak (*Quercus chrysolepis*).

This is one of the largest of the California Oaks, and perhaps the most beautiful of them all; it is an evergreen tree, and the distinctive character to which it owes its Latin name is the golden tomentum, composed of a dense fuzz of jointed glandular hairs which usually covers the under surface of the leaves and the cups of the acorns, although

the amount of this covering and the brightness of its color vary greatly on different individuals; it is generally common, however, on the leaves while they are young, but gradually disappears, leaving the under surface whitish or bluish white.

In the cañons of the Coast-ranges, where the Golden-leaved Oak grows at its best, it is usually a tree forty to sixty feet in height, although individuals nearly a hundred feet tall may sometimes be found, with a short trunk two to four or rarely ten feet in diameter, dividing near the ground into great branches which, spreading at right angles, touch the soil with their extremities and form a mass of foliage sometimes a hundred and fifty feet across. The bark of the trunk and of the branches is ashy gray and covered with flaky scales. The leaves, like the young shoots, as they unfold are clothed with the golden pubescence, and make a charming contrast with the mature leaves of previous years. These are usually about two inches long, oblong, pointed, obtuse or slightly heart-shaped at the base, and usually entire on old trees, although on young and very vigorous trees, and especially on suckers, they are sinuate-toothed. They are thick, firm, bright and lustrous on the upper surface at first, although in time the bright green becomes more or less shaded with yellow. The male flowers, with eight to ten stamens and a five to seven-leaved perianth, are produced in short often branched catkins, while the female flowers are borne on short stalks, or are sessile on the branches. The acorn is oval, obtuse, half an inch to an inch and a half long, and is usually pubescent on the inner surface of the shell. Its base is enclosed in a cup covered with small appressed scales more or less hidden in the dense fulvous tomentum. The cup varies remarkably in shape and size, sometimes being hemispherical and sometimes saucer-shaped and very thick, with a broad thick rim.

In the fog-laden atmosphere of the valleys of the Coast-ranges *Quercus chrysolepis* develops into such a tree as we have tried to describe; more remote from the coast, and as it often grows scattered on high foot-hills, it becomes more symmetrical in the general outline of its narrow head, or at high elevations it is smaller, and on the slopes of the Sierra Nevada, where it is often found between three and eight thousand feet above the level of the sea, in Lower California and on the mountains of southern Arizona and of Sonora it is a small tree or often a little shrub with minute leaves and small acorns, but with the same general characters that serve to distinguish the great tree of the Coast-valleys. Some idea of the manner of growth of the mountain form of the tree and of the general appearance of the vegetation of the high slopes of the Sierra Nevada, may be obtained from the illustration which is published on page 127 of this issue, and which is made from a photograph taken by Dr. Wm. H. Rollins on the mountains overlooking the Yosemite Valley, although a series of illustrations will be needed to illustrate properly the appearance and manner of growth of this remarkable and interesting tree.

As a timber-tree *Quercus chrysolepis* is the most valuable broad-leaved tree of the California forests, although the trunk rarely produces logs long enough to manufacture into boards. The wood, however, which is very heavy, solid and tough, is well suited for wagon-wheels, agricultural implements and other tools, and the best trees, in spite of their inaccessibility, are now fast disappearing. It is probable, therefore, that in a few years, unless they can be protected in some way, all these great Oaks, the glory of California, worthy companions of the Sugar Pine and the Sequoias, and fit emblems of the Golden State, will have disappeared forever; for no one in California ever thinks of planting these trees or of protecting self-sown seedlings, which fall a prey to sheep and cattle, or are swept out of existence by the fires which year after year are burning ever-increasing gaps in the Pacific coast forests.

The California Oaks, when removed from their home, have not usually flourished. They are not hardy in the

east, where, perhaps, our summers are too moist for them; and in northern and central Europe they do not succeed, but in Australia, or in some part of the Mediterranean basin, perhaps some spot can be found where congenial conditions can be provided for these trees, and where, if they grow as they have grown in the California valleys, they will repay the care and labor needed to rear them.

Suitable Names for Country Places.

IN naming a country place there is great difficulty in hitting upon a title that shall be pleasing and suggestive without being hackneyed or savoring of sentimentality.

In an old country like England, where the language bears traces of Norse and Saxon and Roman occupation, there are a number of strong monosyllables descriptive of certain divisions of land that form effective combinations with more familiar words, or with a family name, for the designation of a country-seat or villa; so that their old titles seem particularly happy, and removed from the commonplace. Domesday Book contains a number of these ancient terms in its descriptions of the holdings of the people in the days of William the Conqueror. A toft was a grove of trees on a hill, a croft an enclosure, the meadow-lands were divided into garths and deals by great furrows plowed by eight yoke of oxen, the wavering course of which can still be recognized from some Yorkshire hill, as well as the wide sweeps made by them in turning the corners, showing the curiously unchanging character of English country life.

There were then, as now, moors, or heaths, of wide extent, wolds—which sometimes mean a wood, and again a hilly region devoid of timber, which may once have borne a forest on its rolling surface, of which only the name survives—and holms, which signify low, flat stretches of land near a stream, and also a river-islet. High ridges of land were known as rigs; isolated rocks, like towers, are still called tors; the groves were wealds, and the forest-clearings roydys; gate and forth, in Yorkshire, still mean a road. The old English name for a wild beast, *deor*, which in these combinations means a deer, survives in Darby, or Derby; in Darlands, also written Darelands and Deerlands, and in Dar-ton, which is found in old English as *deortun* (deer-park). A map of Derby, made in 1611, contains an emblematic drawing of a deer-park surrounded by a wooden fence, with a single deer in the middle.

Also, in such names as Goat's Cliffe, Kid Tor, Lamb Hill and Hart Hill linger pastoral reminiscences of old England; Gates head means the goat's hill, and probably Gad's hill is a corruption of the same word, while the palace of the Archbishop of Canterbury, Lambeth, bears record of a heath on which the lambs disported themselves before the town of London was built. A reminiscence of the Druids lingers in Seliok (blessed Oak), and a reminder of Christian zeal in Swinnock (burnt Oak), where the bishops cut down and burned these relics of heathen worship.

Throughout England the rural districts in their names bear traces of its history and its religions, of its early beliefs in fairies and giants, in Norns and sprites, and of the transfer of tradition to saints and the Virgin Mary, so that the titles of towns and fields and homesteads are an unfaillingly interesting study.

In our own geography we have reason to be grateful for such Indian names as have not been supplanted by honored English ones, or ugly inventions of our own, and some of these traces still linger in beautiful country-seats along the Hudson River, which are described by soft Algonquin syllables, as Algonac (hill and river), which is the name of a fine place at Newburgh. Canonchet is the Indian name of the Sprague place in Rhode Island; Noneguacut Farm of a Rhode Island sea-shore home, and Chamcook of an estate on Passamaquoddy Bay, formerly occupied by Mr. Wilson.

There is a pleasant set of names that we often find used both in England and this country, such as Hawkswood, Crow's-nest, Oaklands, Hillside, Bellevue, Eagleswood, and the like, which have become so hackneyed from frequent use that one hesitates to employ them, no matter how appropriate they may be to the surroundings.

Other names have associations which endear them to us, like Sunnyside, which Washington Irving has made famous; Edgewood, where Ik Marvel's farm continues to interest us; Idlewild, that Willis celebrated; Elmwood, where Lowell lived and died, so that we hesitate to apply them to any less well-known place. In fact, when one begins the search for a fresh and telling name he finds the crop pretty well harvested already.

The names of English seats have a dignified and unaffected air, sometimes bordering on harshness, often resembling the titles of towns rather than houses. Thus we have Drentham, the seat of the Duke of Sutherland; Woburn, of the Duke of Bedford; Bowood, of the Marquis of Lansdowne; Welbeck Abbey, the famous mansion of the Duke of Portland, celebrated for its underground rooms; Penshurst, the home of Sir Philip Sidney; Penrhyn, once the dwelling of a Cambrian prince; while Broadlands is associated with Lord Palmerston; Peshanger, with Lord Cowper, and in our own day Hughenden and Harwarden suggest Lord Beaconsfield and Mr. Gladstone of the ready axe.

In our southern states names were always given to plantations, and even to small estates, Jefferson's Monticello and Madison's Montpelier being as well known as Mount Vernon; and the names when given are accepted, as they are not apt to be in the north, where there is always a difficulty in making one's homestead wear a name after it has been christened. In spite of illuminated headings on the note-paper, places continue in popular parlance to be merely Smith's, Brown's or Robinson's, of blessed memory.

There are some good names of what Mr. Downing calls "gentlemen's seats" in the neighborhood of Philadelphia—Stenton, the old Logan place; Alverthorpe, the home of the late Joshua Francis Fisher; Wakefield and Brookwood, of other branches of the Fisher family; Belfield, the dwelling of the Wistars; Restalrig, the place of Mr. G. G. Logan; Aysgarth, of Mr. John Lambert. Barclay Hall was the name one Quaker gentleman gave to his home, in memory of Barclay of Ury, and Oxmead was chosen by another to designate his broad and fertile fields near Burlington, New Jersey. Champlost was so called in memory of a French town, where a former owner narrowly escaped death, and Butler Place was the property of Fanny Kemble's husband, and bears his family name.

People are fortunate when they find an old name that really belongs to the place they inhabit, as Dosoris does to Mr. Dana's island, it being the country contraction of the old *Dos uxoris* in the ancient deeds of the spot. Indian Hollow is another good name that bears an old record in New England, as does Hamlet Lodge, the residence of the late Dr. Alexander Vinton, while Christopher's Camp was the appropriate name of a Maryland farm-house; but such titles are scarce.

It has been suggested by Mr. Rutenber in his *Indian Tribes of Hudson's River*, that many of the Algonquin syllables would form melodious combinations of graceful significance in the naming of places. Thus we might have: Napeena, abounding in birds; Algansee, water of the plains; Iosco, water of light; Iénia, wanderer's rest; Shominac, grape-land; Tallula, leaping waters; Osségo, fair view; Biscoda, beautiful plain; Minoma, good water; Patósia, fair hill; Osio, fine view; Tario, beautiful rocks; Ackiana, good land; Acoma, rock water; Coio, beautiful falls. The syllable *io* signifying beautiful in the last five combinations.

The characteristics of a spot should largely influence the selection of its name, a soft and harmonious landscape calling for melodious syllables to express it, while a wild and rocky scene would find better expression in some rough guttural, some ending in *ough* or *orth*, which might convey severity or sternness in the landscape. There is a bleak and dreary sound in Cawdor, as of a spot haunted by ravens, while in Elsinore and Tantallon we catch the echo of the sea resounding in its hollow caves. Scotch names seem to harmonize with the landscape. Loughrigg, Glencairn, Argyll, Lochiel, savor of rocks and heather, while Stirling and Dumbarton, Crichtoun, Lennel and Montgomerie, have a soft suggestion of sunny stream and laughing brae in their smoother syllables, that lend themselves readily to music, which, however, even their longest and apparently most unwieldy names do at the will of that wonderful minstrel, who sings:

Hoot awa', lads, hoot awa',
Have ye heard how the Ridleys and Thirlwalls and a'
 With Willimondswick,
 And Hard riding Dick,
And Hughie of Hawdon, and Will o' the Wa'
Have set upon Albany Featherstonhaugh,
And taken his life at the Deadman's-shaw?

What a lilt there is in the very sound of the border lairds' dwellings; the song gallops like a bevy of moss troopers over the sod; one hears the measured rise and fall, the clink of hoofs, the jingle of bits, the rattle of reins, the rush of the lads as they sweep on in their fury.

The Scotch habit of naming a man from his acres has a distinct advantage by doing away with the monotony of Grahams and Gordons, Campbells and McIntyres, that would otherwise overwhelm the land of clans. But who thinks of Lochiel as

an estate? yet such it is, and its owner's name is Cameron, while James Hepburn's patronymic is forgotten in the better-known Castle of Bothwell.

Dunira, the seat of Sir David Dundas, we hear of in the poem of the Ettrick Shepherd,

Bonny Kilmeny ga'ed up the glen,
But 'twasna to meet Duneira's men;

while the castle of the Duke of Buccleuch becomes the background of the *Lay of the Last Minstrel*, where it is commemorated in that splendid martial opening,

Nine and twenty knights of fame
Hang their shields in Branksome Hall.

Tantallon, the stronghold of the Douglas, Artornish, where were the "rugged halls" of the Lord of the Isles, live in Scott's stirring verse with Roslin and Rokeby, Marwood Chase and Norham Castle, beside Netherby, Mingarry and Snowdown.

Firbeck is a good descriptive English name for a place, and so are Birkenbog and Netherlaw, which last belong to Sir Robert Abercrombie. Quiddenham and Skutterskelfe, Gwaynenog and Shillinglee are instances of indifference to euphony that we should hardly venture upon in this country.

Holnicate, Hennerton, Ravensdale, Tregothnan, Hackwood Park and Forglen House are all the homes of nobles or gentlefolk in England, and many others might be adduced for copy or example, though some combination with the old Saxon titles of holdings seems the most easily adapted to our needs.

Thorncroft is a good name for hedge-encircled grounds, Maplehurst for an enclosure with fine Maples, Birchwold for a house in the woods, Beechtoft for a hill crowned with these trees, Darhut for a lodge in the Adirondacks. Windycot sounds well for a sea-shore cottage, and Kineforth for a farm. One merry gentleman calls his hunting-lodge on top of a breezy hill Hitititi, which seems like Polynesian, but is pronounced with an English *iota*. Sorrowsikes is the gloomy title of the Tennant Place in Wensleydale, England; while Smyth's Folly is a commemorative term not bestowed by the owner himself.

A substantial volume might be filled with names already appropriated, but the most interesting field for research is in the Indian survivals, which I should be glad to receive from any one who could furnish them, and with them, if possible their signification.

Hingham, Mass.

M. C. Robbins.

Notes of a Summer Journey in Europe.—IX.

I HAD been advised to visit the famous Muskau Park, the masterwork of Prince Hermann von Pückler. Accordingly I went, and was not disappointed. As it was only four or five miles off the main railroad, between Berlin and that part of Silesia mentioned in the last number of these notes, it was an easy matter to stop over at Weisswasser, on the way back to Berlin, and take the short spur railroad to the little village, or town, of Muskau. It is seldom visited by strangers, although only three or four hours' ride from Berlin. The region all around is a most unpromising one for the creation of what has been called the best park in Germany. It is for the most part a sandy plain, which furnishes poor material for vegetable growth, or else the land is so low and flat that marsh-hay is the only harvest. Other large stretches are covered with a growth of Scotch Pine. The park, therefore, seems like an oasis in the midst of a comparative desert. The greater part of the site of the park itself was originally covered by swampy meadows or sandy plains, with no trees except a few old Oaks on some rising ground at a little distance from the River Neisse, which flows through the estate, while a few Lindens were growing near the village.

Prince Pückler carefully studied the peculiarities of each part of the ground before planting, and so laid it out as to obtain the best possible natural effects. It is designed in large, simple, but beautiful lines, appearing as if planted by nature in her best moods, and giving the feeling that any other arrangement would be out of place. Prince Pückler made nature his life-long study, and his whole style of landscape-design rests upon a clear understanding of it. He was regarded as eccentric, a character which has been attributed to many a genius, particularly to students of Nature. Goethe is recorded as having said, on leaving the Prince after a visit at Muskau, "Nature is the most grateful, if the most unfathomable, study, for she makes the man happy who will be so."

In his early travels in England, France and other countries Prince Pückler, no doubt, saw and noted much which was afterward of service when planting his estate.

It is perhaps from the schloss and other points on the western, or village, side of the park that the finest views of the best part of it are to be obtained. The arrangement of the specimens and groups of trees is so admirable that there is not a feature distracting or displeasing to the eye. Fresh vistas and landscape-pictures are brought out at every step or every visit, and roads and paths are so skillfully planned that their existence is unsuspected until they are stepped upon.

Most of the roads are so simply and naturally laid out, with due regard to the natural conformations of the land, that one wishes for a Prince Pückler in the designing of some recently made parks where roads often seem to be a main feature, where hills and great rocks have to be removed or mutilated and natural ponds filled in order to conform to lines traced on some chart, apparently without much reference to topography.

The banks of the river flowing through the estate, and of the artificial lakelets, are broken and hidden by appropriate trees, shrubs, reeds and grasses. Where different kinds of trees have been used in grouping they have been so carefully selected with regard to color and quality of foliage, that the whole makes a perfectly harmonious picture; and where shrubs are used about them to hide trunks and make an unbroken mass of verdure to the ground, the same thorough discrimination is shown. Specimens and groups of Lindens, Maples, Beeches, etc., have been used with charming effect, and the general absence of variegated or other unnaturally colored foliage is very pleasing. Two or three splendid specimens of the purple-leaved Beech do not look out of place. Sometimes three trees have been planted together, the trunks arising together at the ground, but afterward spreading apart, and a broad and handsome effect has been produced, the lower branches resting on the ground. The native White Oak (*Quercus pedunculata*) has chiefly been used in this way. For a number of years, during the planting of the most beautiful and interesting part of the park, large trees were brought from wherever they could be found in the surrounding country, in order to more speedily bring about old, park-like effects. When it is stated that some of these trees were fifty feet high when brought here, we have a slight idea of the tediousness and expensiveness of the work.

A large nursery was established in 1824, and it was then managed without regard to cost or income, as the first great aim was to raise plants for the estate and to introduce desirable species and varieties. To-day this nursery is a regular commercial establishment of 150 acres of thrifty-looking stock. Comparatively few of the plants propagated are now used on the park, and the present proprietor endeavors to make the nursery profitable.

Prince Pückler's enthusiasm led him to expenses beyond his means, and in 1847 he was obliged to sell his beautiful park to Prince Friedrich of the Netherlands, who, it is pleasant to know, carried on the work in much of the spirit of the designer. Prince Pückler died in 1871, and the Prince of the Netherlands in 1881, and the estate then passed into the hands of Count von Arnim, the present owner.

As notices of a general character occasionally appear regarding the Muskau Park, it may be of more interest to briefly note the condition of some of the trees and other plants which have been introduced here. Almost opposite the main entrance to the park is a very fine specimen of the Silver Linden (*Tilia argentea*), with a trunk fully fifteen feet in circumference. At the time of my visit (August 11th) it was in full bloom and giving forth a rich powerful fragrance. It is grafted, apparently on stock of the indigenous species of Linden, at some distance from the ground, and the stock is now considerably smaller in circumference than the trunk of the main tree. One or two other smaller specimens of the same species are to be seen. The marked discrepancy in size and color between the stock and cion, of course, destroys the beauty of the trunk, gives the trees a top-heavy appearance, and affords a warning against the use of poorly grafted ornamental or shade trees, unless the color of the bark of both stock and cion is known to harmonize and the rate of growth to be equal. Of course, where the point of grafting is below the surface of the ground, or even where branching begins, there is not the same objection against the use of dissimilar species as when the grafting is done midway on the stem. Fortunately, cases of this kind are rare in the Muskau Park. Grafted specimens of our Black Ash (*Fraxinus sambucifolia*) and of the Ohio Buckeye (*Æsculus glabra*), the latter on Horse-chestnut stock, are smaller than their stocks, while *Fraxinus pubescens* grafted on *F. excelsior* at several feet above ground has grown much faster than the stock, and the difference in the bark of the two species forms an unpleasing contrast.

Prince Pückler's enterprise secured for him quite an assort-

ment of some of the best of our hardy American deciduous trees. The Red Oak (*Q. rubra*) is here and in other parts of Germany many greatly valued and much planted as a shade tree, and it thrives admirably and grows very fast even on comparatively poor soils. A specimen of this species in the park has a trunk about four feet in diameter; a Black Oak (*Q. tinctoria*) is about three feet through, and there are fine examples of the Pin Oak (*Q. palustris*). Our annual fruited or White Oaks do not appear to thrive here like the three species mentioned, which belong to the biennial fruited or Black Oak-section. A specimen of the Red or River Birch (*Betula nigra*) has a trunk over two feet through; the Tulip-tree flourishes, and the Wild Black Cherry (*Prunus serotina*) grows to small timber size. The ubiquitous Locust (*Robinia Pseudacacia*) is seen in various parts of the park, and in differing soils. In some situations it has become like a weed, and I saw a small plantation of *Picea Sitchensis*, which was considered ruined, owing to the persistence with which Locust-suckers came up among the Spruces. Our Juneberry or Shadbush (*Amelanchier Canadensis*) is here a fair-sized tree, and has been planted in situations where its early summer bloom may make an effective feature in the landscape. There appears to be much interest in our Hickories in Germany, but there is frequent complaint that they do not thrive well. In good soil at Muskau, however, they seemed perfectly at home, and quite as vigorous as any I ever saw. Shagbarks (*Hicoria ovata*) forty or fifty feet high, Mockernuts (*H. alba*) forty feet high, and large Bitternuts (*H. minima*) were fruiting freely, and the new growths on the branches averaged six inches or more. Of our conifers the White Pine and *Taxodium* are among the best, and there are some very fine specimens of the latter.

Although many foreign trees have been introduced throughout the park, the skillful designer relied upon indigenous species in his most effective work and in the planting of woods. Native Oaks, Lindens, Beeches and Maples are largely employed, and the free use of the Hornbeam (*Carpinus Betulus*), with its light foliage, breaks the monotony which too many heavy-leaved species would produce. Groups of the native Alder (*A. glutinosa*) have been freely planted. This becomes a large tree, and a splendid specimen of a cut-leaved form was noted, which has a trunk nearly two feet in diameter, and has much of the aspect of a Red Oak in foliage and branching. Some good specimens of the so-called Crimean Linden (*Tilia dasystyla*) are to be found here. This is a tree of comparatively recent introduction into cultivation, and it gives promise of becoming valuable in street-planting. It is a very distinct species, being easily known from all others by its dark shining green foliage. For size and age and sturdy grandeur some native Oaks (*Quercus pedunculata*) are the pride of the estate. A number of these are from sixteen to eighteen feet in circumference; other individuals measure twenty-two and twenty-four feet, while the largest, known as "Hermann's Oak," is twenty-eight feet around at two or three feet from the ground, and is estimated to be over eight hundred years old.

The scientific as well as the æsthetic interest of those who planned and completed the park is shown in the arboretum which was planted about 1858 under the direction of E. Petzold, the park inspector, who was most deeply interested in the project. This arboretum comprised several hundred acres, most of the soil being sandy or rocky, although there were some fairly fertile small portions. During the past ten years it has been entirely neglected, and has become overgrown with Lichens, Heath (*Calluna*) and Broom (*Cytisus scoparius*), and haunted by deer, rabbits and other animals encouraged by sportsmen.

All the trees and shrubs were systematically arranged according to families and genera, and the species were thoroughly and distinctly labeled. A large number of these labels still stand, where not broken by roaming hoofs. They are neatly made of coarse earthenware, about an inch thick, with the lettering stamped in and painted black, and afterward glazed and fired. The length of the label is over a foot, the upper half neatly squared and margined, the lower tapering, to facilitate insertion in the ground. The catalogue number, scientific name, with the authority, the family and habitat are given. This gives an imperishable label, if not subjected to hard knocks. In arranging the specimens three individuals of a kind were commonly planted in a triangle; but a larger group was sometimes formed.

A walk through the arboretum now furnishes some interesting object-lessons in the behavior of some of the introduced plants under absolute neglect and in sterile soil. Most of them are dwarfed and stunted, and it is only a matter of a few years before they will disappear. Gray, lichen-covered specimens of *Viburnum dentatum*, *Myrica cerifera*, *Halesia*

tetraptera and others looked very forlorn, but *Clethra alnifolia* was flourishing and seemed quite at home. Our Wild Crab (*Pyrus coronaria*) was thriving quite as well as any member of the genus to which it belongs, but it was not fruiting.

In one or two places in Germany inquiries were made for the Rose Acacia (*Robinia hispida*) on its own roots instead of grafted. In this neglected arboretum it was found springing up spontaneously, over considerable ground, from spreading underground roots. These plants were slender and diminutive, appearing almost herbaceous by growing among the heath, which they hardly exceeded in height, but were freely bearing flowers.

Adjoining the park are the mineral baths of "Hermannsbad," which were developed and brought into notice by Prince Pückler, and which are annually visited by large numbers of people from the German cities.

Arnold Arboretum.

J. G. Jack.

Notes in the Woods.

ALTHOUGH I have been a farmer for years, I have never until lately owned any considerable stretch of woodland. But my "neck of woods" interests me now more than any other part of my farm-lands. It lies in a deep valley on both sides of the Clyde River, a stream fed by many springs, and passing through or contributed to by a number of small lakes of remarkable beauty. Its source is Island Pond (a name familiar to many as a station on the Grand Trunk Railway), and it has run nineteen of its twenty-one miles of length before entering Lake Memphremagog, when it becomes, for some hundred rods or so, my own particular property. This deep gorge, between one and two hundred feet below the level of the surrounding territory, is covered chiefly with Maples, constituting what is known as the "Sugar Place" of the farm. But there are also a goodly number of Beeches, Canoe Birches, Spruces, Hemlocks, Firs, Poplars, Ashes, Pines, and by the river-banks dense thickets of *Arbor-vitæ* in sizes from two feet in diameter down to those just right for hop-poles and bean-poles. The narrowness and depth of the valley causes all these trees to run up very straight and tall, with but a small amount of top, many being as much as forty feet from the ground to their lower limbs. All among them copious springs burst forth, one of the largest furnishing water to actuate a hydraulic ram which supplies the buildings of the farm with the purest and softest water.

One of the first things that attracted my attention in regard to the trees of this valley or ravine was that a large proportion of those of much size are rotten at the heart or hollow. This is noticed in more than one-half the logs that are drawn up to the house for firing. Not many of the Spruces or Firs are thus affected; but I was astonished to note that what are called our most durable timber-trees, used everywhere for fence-posts, the *Arbor-vitæ*, become thus decayed by the time they are a foot through. I had thought that perhaps this might be due to the severity of the climate; but a visit to the Aroostook country, in Maine (whose southern extremity is one hundred miles north of my latitude), showed me, in its beautiful and perfectly sound *Arbor-vitæ* timber, that this could hardly be true. I have since noticed that a very large proportion of the *Arbor-vitæ* logs brought to our mills to be sawn into shingles, or sold for posts, are rotten at heart.

In my experience the Firs make a better and more lasting roof-covering than the Cedars. Some twenty years ago, in building a house upon my old "home place," on the Memphremagog shore, being desirous to avoid the Cedar taste in cistern-water I had the part of the roof from which the water was taken covered with Fir shingles, the remainder being covered with the best cedar to be had. Sixteen years later, when re-shingling became necessary, the Fir shingles were found to be considerably sounder than the others.

The Maples interest me greatly. Not only the Sugar Maple, but the Red and White Maples abound, covering both flanks of the valley above the wetter portions near the river. Some months ago I mentioned that we had a sort of Maple which neighboring farmers say is not the White Maple, though they have no other name for it, and it looks to me like a White Maple. The sap of this tree acts quickly and strongly upon the iron spouts used to conduct the sap into the buckets set to catch it, and makes the syrup quite black and unfit for sugar. One can notice the quickness of its attack upon the iron as it trickles over it; but this appears only with a few trees, the sap of other White Maples not showing this quality. The only difference I can note between the trees which do and those which do not have this peculiarity is a darker bark on the former.

I cannot distinguish even the slight difference I have referred to, except in the larger trees, and I have been waiting until another season to notice, if possible, any difference in the blooming time or anything else of a specializing character.

I was struck by a short notice in the *Boston Daily Traveler*, of February 20th, relating to Indian basket-makers in Maine. In this notice it was said, speaking of the bright colors that were secured from the woods by these sylvan workmen, that "Alder is steeped for pale red; White Birch bark for bright red; Cedar-boughs for green; Sumach for yellow; black comes from White Maple bark. A light solution of Maple, however, shows purple instead of black." It may require the skill of a chemist, along with that of the botanist, to get to the bottom of this little problem. It seems quite probable that this blackening of the sap by contact with the iron spouts occurs only in the case of a few out of many of the trees supposed to be all White Maples. One old farmer said he thought these might be a cross between either the Red or the Sugar Maple with the White—but he was no botanist. Is it not possible that this peculiar tree may be a hybrid between the Red and White Maples?

Newport, Vt.

T. H. Hoskins.

Cultural Department.

Housetop Gardens.

THE effort of the directors of the Columbian Horticultural Exhibition to show roof gardens on an extensive scale is a step in the right direction. City life cannot only be made more comfortable by a supply of fresh flowers and vegetables but it can secure considerable of the greenness and aroma of the country. The present style of building is, with slight adjustments, well-adapted to this. I have seen the roof of a house and wing utilized with a lean-to glass roof, without any heat beyond that obtained by an open door into the upper hall. But, if needed, portable heaters could be used. In one case a friend has conducted steam pipes from his furnace into his roof-room, where he makes a specialty of growing Cacti. Housetops, when flat, can be covered with glass and used for a great variety of fruits, flowers and vegetables. This also can be heated in winter, mainly by the hot air that is wasted in the house. Better yet, it is carbon-laden air that goes up; and is ready to be used by vegetation. As a matter of health, the roof garden has decided advantages, provided it be wisely constructed. I know a dweller in a western city who grows his tomatoes and cucumbers in half-barrels and tubs filled with rich soil. His garden is on a second story roof, and a door opens into an upper hall. His purpose is not so much a winter garden as a summer garden. Besides vines, he grows an abundance of lettuce and radishes, and even gooseberries and currants. Probably most cultivators would prefer to experiment with grapes, figs, and perhaps dwarf oranges. This is a matter of taste. The roof garden may be made convenient for almost any sort of vegetable growth not too heavy for the framework of the house. I have seen pumpkins grown to perfection on a New York roof, and tubs of charming evergreens, six or eight feet high. The growth of flowers on a roof may be conducted in connection with fruit and vegetable growing, or alone, and I have had some choice bouquets from such gardens.

I have spoken of roof gardens with glass overhead. This is but one, and the more expensive method of establishing such culture. The ordinary garden has no cover, and it may be as well established on a housetop as in the back yard. The only thing necessary is to make the weight proportioned to the timbers of the house. The London *Horticultural Times* is urging this sort of summer garden on the people of that metropolis. It proposes an iron spiral staircase ascending from the upper floor through a turret leading to a plateau where the growth is established, and seats are provided for rest and pleasure. Protect the roof with a strong parapet and then lay out your garden as you please. The same London journal proposes as follows: "At the back, partly or right across, one could erect a simple and cheap little glass house; or it could stand exactly in the centre. Around all the sides of the parapet and the glass house one, two or even three rows of pots of various sizes could be placed, in some of which the seeds of plants or flowers could be grown, and the glass house could be utilized for the production of such seeds and bulbs as required, or are improved by being raised under cover or in heat." But this at once turns the open garden into a matter of care and expense. I should prefer simply to use large tubs or boxes, and grow such plants as require only sunshine, air and water. The cultivation would be simple. In many cases water could be carried to the roof as it is to the

rooms below. A stout roof could be built that might sustain a garden spread over a part or even the whole of the surface, with soil deep enough for vegetables, vines and flowers. Here is a chance for even more taste and ornament than in an ordinary garden. I think weeds would be less troublesome, and insects of the worst sort would be quite shut out. What a chance for a Rose gardener, and for Lilies and Gladioli. All the common flowers like Wallflowers, *Tropæolum*, Mignonette, Petunias, and, above all, Geraniums would readily take to such a home.

As an economical measure the roof garden may constitute a noteworthy feature of future city life. The poorer families, unable to command a rod square of area below, may grow some of the most needful provisions above. Oriental nations have for ages utilized housetops for all sorts of purposes. Not only kings, but the populace eat, sleep and garden on the roofs. The suburbs of American cities need nothing of the kind; but the city houses do. The tenement-house would be easily robbed of some of its terror if the roof were furnished for sleeping; and with a few tubs of trees and common flowers. So far we have looked more to the glory of increasing the size of cities than to the increase of their attendant comforts. Economy and health and pleasure can all be combined in roof gardening.

But the most practicable immediate use of the roof garden is for the families of professional men and others who long for some contact with growing things, a bit of nature, wild or tame, all to themselves. Most women would enjoy such a resort, and the homely comfort of dabbling in dirt.

The experiment at Chicago is a happy thought. The whole subject can be studied. I hope the effort to produce grand effects will not predominate to the exclusion of the wants of those who can only work in a humble way. It is plain poor men's and poor women's problem in one sense. It is the flower-pot multiplied and put to practical purposes. And if a single window-plant may help to brighten the life of the city poor, roof gardening may help considerably to relieve some of the trying conditions of city life.

Clinton, N. Y.

E. P. Powell.

Roses.

AS the sunshine strengthens with the approach of spring more ventilation will be needed in the Rose-house, but low temperature with high winds often prevail in March, and if these cold draughts are permitted to circulate among the Roses an attack of mildew will inevitably follow. The heating apparatus also requires close attention, for while the nights continue cold, the days are often warm, and consequently the temperature under glass may change rapidly. It is a safe rule to begin ventilating as soon as the temperature in the Rose-house reaches seventy degrees, and to increase it gradually as may be necessary.

All watering and syringing should still be done early in the day to prevent excessive moisture during the night, though syringing may be done with more freedom now than a month earlier, and the water should be applied with sufficient force to prevent red spider from getting a foothold, since this pest is likely to appear at this season. Liquid manure is generally beneficial now, but is best applied in moderation, and only the clear liquid should be used after the solid matter has settled to the bottom of the tub or tank. Much injury is done by applying thick manure-water, from the fact that the sediment forms a comparatively air-tight coating on the surface of the soil and prevents its proper aeration. Old-established plants will, of course, assimilate more strong food than those less firmly rooted, but it is better to err on the side of moderation than of excess. Of course, it is understood that proper soil has been used in the first place for filling the beds.

Early Rose-cuttings will be rooted before this, and it is well to pot them off before the roots grow to any great length in the cutting-bed, for there will be less liability of breaking the roots in the operation of potting while the roots are short, and the young plants will become established much more quickly than those whose roots have been crippled. Young Roses must not be permitted to starve in very small pots if healthy and strong plants are desired for summer planting, for under such treatment little more than a stunted growth can ever be hoped for.

At this season some good cuttings may be secured from hybrids that have been forced early, and from which the crop of bloom has been cut. The sooner such cuttings are put in the better, in order to furnish young stock for next season's crop. Firm shoots with clean and healthy foliage only should be selected for this purpose, and with reasonable care they will soon root.

The decree of fashion seems to have been somewhat against the old favorite, La France, this season, and even more so against its offspring, Duchess of Albany. This is perhaps less surprising in the latter instance than the former, for while the Duchess of Albany is very handsome when in perfect condition, yet many of its flowers are too dull and undecided in color to appeal to the fastidious buyer, and as soon as its novelty had worn off its popularity began to wane also. Catherine Mermet has been much more in demand, the lighter shade of pink being preferred, and there are certainly few Roses that can compare with this one for beauty of form and delicacy of coloring when well grown. Meteor, too, has been gaining in popularity, and with some growers proves a profitable variety, while in other localities little success has been found with it. Still another sport from Mermet is to be disseminated soon, and from the description it seems to greatly resemble Waban, and possibly may be identical with it, for it is not extraordinary for the same freak to occur in two localities. This actually happened in the case of The Bride.

Holmesburg, Pa.

W. H. Taplin.

Bulbous Plants in Winter.

IN the greenhouse January and February are very satisfactory months. The crops of flowers are abundant, and there is not too much pressing work. The propagating season has not fairly begun, and, besides routine work and entomological studies, there is little to do beyond watching the expanding flowers.

In any greenhouse room is very valuable, and in a small one it is only by the exercise of considerable management and foresight that the house is kept well furnished with flowers at all seasons. "Plants which are always in bloom with showy flowers" are still rather scarce, and only a certain proportion of a small house should be occupied by permanent herbaceous plants—these to include, of course, such decorative plants as may be required for foliage effects or may interest the grower. Many amateurs are interested in special species and devote their entire attention to them; but where it is simply desired to secure a constant succession of flowers at all seasons it will be found that a well-selected stock of bulbous plants are the amateur's best reliance. With a good supply of these the smallest house may be kept always gay, reserve stock being brought forward at the proper season. After flowering they can be put in an inconspicuous place to open or rest, and be replaced by others.

The variety of bulbs, corms and rhizomes is endless, giving one an opportunity to select a good supply of those pleasing to one's particular taste. The common bulbs, which are needed in some quantity and are repotted each season, are best grown in short pots or Lily-pans, those of eight inches in diameter being a useful size, and if of standard pattern can be snugly packed away when not in use. These are not very conspicuous, and hold sufficient earth for most bulbs. They are much preferable to ordinary deep pots of the same diameter, which are too prominent, and to flats, which are very difficult to place on an ordinary greenhouse-bench and cannot be taken into living-rooms. In these pots the bulbs should be planted thickly for effect when in flower, and allowed to make root in proper quarters, which will vary according to the species. Fortunately, some of the commonest, cheapest bulbs are the most satisfactory, and it is possible to have a succession through the winter with very slight expense. Roman Hyacinths are perhaps the most satisfactory winter-bulb for all purposes, being free, graceful, not too fragrant, and to be had at any desired time; the rose and blue are pleasing, but not as useful as the white. The Dutch Hyacinths are popular flowers easily grown, but one usually apologizes to himself as their lumpy flowers appear, for a plant not pleasing both in form and color is never quite satisfying. Their mass of color is useful, however, in brightening up dark corners. A few pans of Tulips, especially of the light colors, should always be grown, but will need care in not bringing on too quickly. Freesias are deservedly popular and never in too great supply, though the bulbs increase so freely. There does not seem to be any difficulty in growing this desirable plant in a cool greenhouse. It is well to try to select bulbs giving the purest white flowers, which are the most pleasing. Allium Neapolitanum is one of the most useful winter-blooming bulbous plants. The bulbs force readily, and the cymes, of pure white flowers, are very attractive. Unlike other varieties of this family, this has no objectionable odor.

Of the Narcissi, the Paper Whites and bunch-flowered kinds, generally, are so charming that one hesitates to add that they are also malodorous and impossible flowers for cutting. A pan of *N. Bulbocodium*, or Hoop-petticoat Daffodils, is



Fig. 20.—The Golden-kevel Oak (*Quercus chrysolepis*) on the high Sierra, Nevada.—See page 121.

very charming, and, in fact, one can scarcely go amiss in growing any of the varieties. There is such a wealth of material in the family which may be had at a low price that it does not seem worth while to risk choice varieties in the warm house, where they are often neglected after flowering. Of the double varieties the Trumpets or Von Sions, and the incomparabilis, Codlins and Cream (albus plenus sulphureus) are the best. Of the latter section there are many very inferior varieties on the market to be avoided. The large single Trumpet, or Ajax Narcissi, are the most pleasing. Of the bicolors Horsfield's is the best, but being still high-priced a substitute may be found in *N. bicolor præcox*, the Italian bulbs of which are very cheap, and while not all true to type as sent out, are very satisfactory. Mr. A. Blanc kindly secured for me a bag of these as collected, which were very interesting, as they were all handsome forms with considerable variation in coloring. No collection is complete without a supply of *Cyclamens*, while among the *Amaryllids*, *Crinums*, *Hippeastrums*, *Nerines*, *Pancretiums* may be found many handsome flowers. If somewhat cool quarters can be found, the Cape bulbs open a wide field of interesting things which generally have to be brought on slowly. Pans of *Lachenalias* are quaintly beautiful, as later on are *Ixias*. *Gladioli* species are to be had in many forms, two of the best being *G. Colvilli* (The Bride), a fine white variety, and *G. tristis sulphureus*, a yellow kind. The bulbous *Irises* are choice things, but rather fugacious, *Iris reticulata*, however, being much more lasting than *I. Pavonia* or *I. maricoides*, which latter is a quaint little plant just now in flower. Before the last of the winter-flowering bulbs disappear and the fires go out summer bloomers, like the *Gesnerias* and *Begonias*, will show signs of life and may be brought forward for succession.

Elizabeth, N. J.

J. N. Gerard.

Sowing Beets and Radishes.

MANY people at the north delay sowing Beets and Radishes until rather late, for fear of frost. These vegetables will endure much cold, and it is easy to get them early with little trouble. In this latitude we sow Radishes at any time after the 1st of February, and Beets after the middle of the month, though we are apt to have returns of frost all the month. The first requisite for getting early Beets and Radishes is a mellow, deep and very rich soil. A heavy application of an ammoniated fertilizer is preferable to stable manure, as it makes smoother roots. Get the soil on a warm border ready as early as it is possible to work it in good condition. Sow the seed in rows rather thinly. Seed of the scarlet Turnip Radish can be sown in same row with the Beets if space is limited, for they mature so quickly that they can be pulled out of the way by the time the Beets want all the space. Now have at hand a quantity of straw; good, long, straight rye-straw is best. Cover the bed with straw on frosty nights, but expose it to full sunshine in the daytime. Beets will endure quite a sharp hoar-frost after they are fully up above ground, but if caught by frost just as they are coming through they are very easily hurt. Radishes will endure much harder frost. But the straw cover will ward off any frost above twenty degrees, and enable one to get his beets and radishes much earlier than his neighbor who waits till frost is gone. Of course, any one who has a cold frame and some sashes can get his Radishes and start his Beets early; but I make this note for the benefit of the larger number who use no glass. The Egyptian Beet is a favorite of market-men on account of its small top, but it is of poor quality. Eclipse is better, but for those who prefer quality to looks, and who do not imagine a beet is better because dark red, I would recommend the old Bassam. It is as early as any and of better quality. Its big top is the only objection, though some dislike its light color. For a very early Radish the Scarlet Turnip is as good as any, but some Long Scarlet Short Top and some of Beckert's Chartier should be sown at the same time. The Chartier is good as soon as it is large enough to pull, and keeps on growing to a very large size before it becomes pithy.

Raleigh, N. C.

W. F. Massey.

Brodiaea (Triteleia) uniflora.—This plant was introduced into British gardens from South America about sixty years ago. It is perfectly hardy in England, and is said to be equally hardy in our eastern states, though I have never seen it out-of-doors here. Under pot-cultivation, however, it is excellent, and it is now in full bloom. It is a dwarf bulbous plant of the Lily family, forming dense masses of linear, pale green foliage, from which emerge the long, slender, erect scapes, each bearing a single starry blossom about an inch and a half in diameter, and of a deep lilac color when it first opens out, turning to pure white as it grows older. The flowers are produced

very freely during the latter months of winter and in early spring, and the plant is then strikingly beautiful. It is a first-rate subject for the window-garden, and thrives luxuriantly in ordinary soil provided it has a full supply of water while growing. Repotting is not often necessary, unless the drainage is faulty, but an annual top-dressing late in fall, before growth commences, is beneficial. The bulbs should have complete rest, that is, they should be totally deprived of water during the dormant period, and they will be most effective when closely planted in wide pans, where they will make a large and compact display of leaves and flowers. The only objectionable quality of the plant is its offensive garlic-like odor. This, however, is not perceptible unless some portion of it is bruised; the flowers themselves give off a faint sweet fragrance under ordinary conditions. Several varieties of this *Brodiaea*—or, as it has been generally called, *Triteleia*—are said to exist, but I have never been able to secure any of them. Certain variations are represented in the books, but they are probably unusual.

Cambridge, Mass.

M. Barker.

Crandall's Currant.—I have discovered a good use for this plant. With me it is a failure as a fruit-plant; it is, in fact, only a moderately good variety of *Ribes Missouriensis*. But it can be forced for winter flowers to great advantage. Its dwarfish, drooping, compact form of growth makes it adaptable to pots, and it grows with so little care and blooms so freely that I am inclined to place it at the head of the shrubs which can be forced for common home use. Small plants bloom finely, and the flowers are as sweet as they are beautiful.

Clinton, N. Y.

E. P. P.

Orchid Notes.

Orchids at North Easton, Massachusetts.

SO many unique and distinct varieties have been added by Mr. F. L. Ames to his collection that the visitor at any season will find something of interest in bloom.

In the large *Cattleya*-house are now to be seen well-grown specimens of the white *Cœlogyne cristata* covered with its snowy blossoms, besides specimens of the ordinary form in pans three feet across, and the true *St. Albans* variety of *C. cristata maxima* with over one hundred flowers. The *Lælias* of the *Anceps* type are showing well this season. A superb example of the variety *Stella* had twenty-two spikes carrying seventy-five perfect blossoms, and one of the variety *Sanderiana* had fourteen strong spikes. Mr. Wm. Robinson, the gardener here, gives plants of this section a long rest after flowering, with ample light and air while growing. *L. anceps Schrœderæ*, a pretty and very rare form, carried six fine blooms, its round petals being tipped with a fine magenta-purple, the lobes of the lip a rich purple, the front a dark velvety purple, with a prominent orange disk. Dawson's variety and Williams' variety are represented by first-rate plants, while among the red forms *L. anceps Winneana* was the finest, although other good ones like *L. anceps Scottiana*, a very rich dark-colored form, are just out of bloom. Of course, there are masses of the typical *L. anceps*, many of them distinct in character and remarkable as specimens. Mention should be made of the variety *Percivaliana*, which was represented by several fine plants.

Among the hybrids *Lælia-Cattleya Hippolyta* was flowering, with three soft yellow blossoms, each with a rosy-veined lip. This is a charming plant obtained by crossing *L. cinnabarina* with *Cattleya Mossiæ*. The pretty *L. flammea*, another very attractive hybrid between *L. Pilcherii* and *L. cinnabarina*, bears three spikes carrying nine handsome buff-yellow blossoms with lips of bright purple.

Some of the finest *Cattleyas* have finished flowering; but among the forms of *C. Trianae* in bloom was a plant of the true variety, *Leeana*, obtained from the Lee collection, which had three spikes. The enormous flowers have increased much in size since it first bloomed; its broad sepals and round petals, together with the bold purple lip, make a striking display. The variety *Backhousiana* is well flowered, and is readily distinguished by its broad blotched petals and richly colored lip.

Dendrobiums here are great favorites, and among the many in bloom is the pretty *D. Cybele*, a charming hybrid between *D. Findlayanum* and *D. nobile*, having white and rosy-tipped sepals and petals, lip white, with a suffusion of orange-yellow surrounding a purple blotch in the throat. *D. Aspasia*, an elegant hybrid between *D. Wardianum* and *D. aureum*, carries fourteen flowers. A profusion of delicate white and purple blossoms is to be seen on a well-grown plant of *D. euosium leucopterum*. There are two forms of this, but the plant here

noted is the finest. Over one hundred flowers of *D. Schneiderianum* make a mass of white golden yellow and purple, which proves it one of the most striking of hybrid *Dendrobiums*. It is of easy culture and quickly makes a specimen. Varieties of *D. nobile* were abundant, among them many plants of Cooksoni, the true *Nobilium*, and *Arnoldianum*, with its distinct broad purple stripe on the lower sepals. Schröder's variety of *D. Wardianum* bears to the type the same relation which the variety *nobilium* does to *D. nobile*, and its flower is strikingly beautiful and rich in color. The rare *D. MacFarlanei* shows fine clusters of its peculiar white blossoms, and *D. micans*, a hybrid between *D. Wardianum* and *D. lituiflorum*, bears masses of flowers. The hybrid *D. chrysodiscus*, *D. Goldei*, from Australia, and many plants of *D. Phalænopsis Schröderianum* are all noteworthy, especially a rich-colored form of the latter, which is much admired here. In this house is a group of choice *Cypripediums* in bloom, among them the hybrid *C. Calypso*, Low's variety of *C. villosum*, *C. nitens*, *C. Godseffianum*, *C. Petri*, *C. Niobe*, *C. ænanthum superbum*, *C. Measuresianum*, *C. Aylingii* and *C. leuchorhodum*—all in admirable condition and many of them noble specimens.

In another house four hundred flowers of *Odontoglossum Pescatorei* and the same number of *O. Alexandræ* make a brave show, and in the same house are quantities of *Cœlogyne cristata* and its variety *Lemoniana*. The most remarkable Orchid in the whole collection is here, the rare *Miltonopsis Bleui splendens*, a most beautiful hybrid, between *Miltonia vexillaria* and *M. Roezli*. It has two spikes of blossoms, which measure individually four inches across. The petals at the base are suffused with rosy purple, and the centre of the flower resembles a reversed coronet in fine bronzy purple. *Zygo-Colax Veitchii*, another interesting hybrid, shows sixteen flowers, with sepals and petals lemon-green, profusely spotted with blackish purple. Several plants of the white *Lycaste Skinneri* were flowering, and included a fine form named *Chantini*, with flowers of remarkable size.

Among other choice *Odontoglossums*, a first-rate plant of the variety *Dellense* of *O. tripudians*, carried a dozen of its yellow and chocolate spotted flowers; the rare *O. Pescatorei excellens* shows as many more. *Candidulum*, a white-flowered variety of *O. nebulosum*, is opening large white blooms with an orange-yellow crest; a distinct form of *O. ramosissimum*, named *Xanthinum*, is beautifully decorated with yellow and violet spotted flowers. Here, too, are the rare *O. Leeanum* and *O. Chestertoni*, while *O. Rossii* is represented in great variety and abundance.

Masdevallias delight in the cool moist corner allotted to them in this house. Here are several distinct hybrids, including *M. Measuresiana*, with white and pink blossoms; *M. Hincksiana*, with yellow flowers when first expanded, becoming paler in the centre with age; *M. Courtauldiana*, with blossoms of a soft rose color with yellow tails, and a new one, obtained by crossing *M. ignea rubescens* with *M. Lindenii*. The flowers of this hybrid are as large as the last-named, lilac in color, with the conspicuous stripes of *M. ignea*.

There is no need of specifying any other individual plants, although scores are to be seen here which would add materially to the value of any collection in the world. Many of the plants are matchless specimens; all are thrifty and happy, and bear witness to the exceptional care and skill with which they are managed.

New York.

A. Dimmock.

Orchids in Flower in New York City.

SEVERAL interesting plants are now flowering in the collection of Mr. Hicks Arnold, in Eighty-fourth Street, and at this dull season they are doubly welcome. It would be difficult to find elsewhere such a variety of Orchids in one structure, many of them ranked among the stove Orchids, thriving so vigorously, and attaining such dimensions, in so short a time. Very little shading is used here. The *Cypripediums* are grouped on the north side of the house, and produce annually a rich display of bloom. The *Cattleyas*, *Lælias*, *Dendrobiums*, *Oncidium*s, etc., receive the brightest position where air is admitted in abundance during their period of active growth.

At this season the *Cattleyas* form a leading feature, especially those of the *Trianae* class, among which are many elegant varieties. One of these is strikingly beautiful, having flowers measuring eight inches across, with a broad, open, intense purple lip, finely fringed. Here also is a true albino form, with snow-white flowers and orange throat. There are many so-called *Albas*, which, on close examination, show traces of pink; but the variety here is noted for its purity.

Lælia cinnabarina is flowering well, and so is a fine specimen of the true *Dendrobium crassinode album*, and the pretty *Lycaste Youngii*, a charming form of *L. Skinneri*, with salmon-colored flowers.

Dendrobium luteolum reminds one in color of the English Primrose, and near it is a fine specimen of *D. nobile Arnoldianum*. This is the largest plant of the variety in cultivation. Its blossoms are quite distinct, with a broad dark purple stripe on the basal half of the lower sepals, the lip being furnished with a very rich maroon centre, and the whole flower showing the same rich color as is found in *D. nobile nobilium*. Hill's variety of *Lælia anceps*, and near it a fine example of *Spathoglottis Kimballiana*, its golden yellow blossoms greatly resembling a *Phalænopsis*, are both well flowered. *D. dicuphum*, a rare plant from Australia, here shows elegant sprays of white flowers.

In the centre of the house is a fine specimen of *Ansellia Africana* carrying a spike of over one hundred blossoms, and the now popular *Dendrobium Phalænopsis Schröderianum* fully justifies all that has been written in its praise. One spike had produced seventeen elegant flowers, which were large and flat, and fine rosy purple, with a lip of intense purple. They are arranged gracefully on a long stem. The plants here receive as much light as possible, and are growing freely suspended from the roof. One of the finest Orchids in the whole collection is a specimen of the rare *Phajus Cooksonii*, a beautiful hybrid obtained by crossing *P. Wallichii* with *P. tuberosus*. This season it has produced on two spikes twenty-six perfect flowers, which are light bronze in color, the lip yellow, with numerous purple markings running the full extent of the throat.

The *Phalænopses* are just past flowering, but the ivory-white blossoms of *P. tetraspis* and the cream-yellow flowers of the rare *P. Micholitzii* still remain. *Vanda teres* and dozens of *Lycastes* and *Oncidium*s make a very attractive show. Among the *Cypripediums* is a specimen of *C. Schröderæ splendens*, showing three strong spikes of richly colored blossoms; the pretty *C. microchilum*, with an unusually large pouch; *C. Hera*, a bold-flowered hybrid; several plants of *C. Lathamianum*, a cross between *C. villosum* and *L. Spicerianum*, are flowering finely. Here, too, are *C. nitens*, the pretty *C. Schlimii*, several fine specimens of *C. callosum*, a handsome specimen of *C. grande*, and the rare hybrid *C. macropterum*, one of the best in the group, bearing its handsome marked blossoms on a long stem. Other noteworthy *Cypripediums* in flower are *C. Petri*, Smith's variety of *C. Dayanum*, the beautiful hybrid *C. radiosum*, its broad dorsal sepal suffused with numerous lines of rosy purple; *C. euryandrum*, with five spikes; *C. Sedenii candidulum*, with four spikes; *C. vernixium*; several distinct forms of *C. insigne*, and a striking form of *C. Boxallii*. *C. villosum* is abundantly represented, while a great variety still promise flowers, and for several weeks to come there will be plants in bloom to interest all lovers of this fascinating genus.

New York.

D.

Correspondence.

A Small Conservatory.

To the Editor of GARDEN AND FOREST:

Sir,—I have a small conservatory without roof-light and not reached by the sun till after one o'clock. The heat is obtained from adjoining rooms, and in cold days the temperature often falls below sixty degrees, and well below fifty degrees at night. Still, the collection is now in a fairly thrifty condition, and some plants are flourishing.

A conservatory, with no greenhouse to draw from and with other drawbacks to contend with, must be carefully managed to succeed, and this letter is written, in part, to draw out experience from others, who may have solved problems that I have not. The first mistake likely to be made, supposing the plants to be well potted and thrifty, is to leave them out in the fall till they have suffered from cold weather. They should be brought inside before chilly nights come on, especially *Begonias* and other tender sorts, and the windows of the house should remain open as long as the weather permits. The flowers and often the leaves of many species will drop if brought in late and denied fresh air.

December and January are the trying months for winter-growing plants. February, even if cold and cloudy, affords many more hours of daylight than either of the two months preceding, and March is sure to be partly warm and sunny.

Set all tender plants on the upper shelves and away from the cold, exposed corner of the conservatory, and place the hardiest ones near the floor. Many desirable species will thrive on low

shelves where the glass is nightly covered with frost in severe weather. For the necessary moisture an oil-stove with a single five-inch burner will keep a half-gallon of water boiling any desired length of time, and the oil used is very little. Sprinkle the plants only when this added warmth and moisture are present. The evaporation of water from the leaves always cools them a good deal, and it will chill them if the room is cold and dry enough to make evaporation rapid.

Give outdoor air as often as safe, letting it come in through another room if possible. This rule is always insisted on, but it is too seldom followed. When a plant stops growing encourage it in taking a season of rest, by light watering, if that is thought to be the reason for inaction, but restore, if possible, the lost condition necessary to vigorous growth where rest is not thought to be needed.

From lack of heat, and in a less degree of light, I have been obliged to neglect this point somewhat, yet I do not think repotting is resorted to soon enough, generally, in cases of failing vitality. A large vigorous Leopard-plant (*Farfugium grande*), which thrives on the lower shelf, requires, like all of its species, copious waterings, but after a season without repotting it droops very soon after watering. It is then taken out of the pot and every particle of soil washed from the roots by agitating it in a pail of water. A careful repotting in new strong soil will completely restore it. Most plants should be occasionally repotted in the same merciful way.

Now as to plants that succeed variously in the conservatory described. It is not quite warm enough for *Abutilons*. The three varieties in the collection grow quite well, but they are not very stocky and most of the buds drop off. They are now budded again, and will blossom if the weather is not too severe. *Begonias* generally require more heat than I can give them. Of about fifteen species several drop their leaves badly, and only *B. carnea* and the round-leaved species really thrive, though *B. metallica* has done fairly well. No conservatory should be without *B. carnea*. It is perfectly at home there, and it blossoms in December, when flowers are scarce. It may not be generally known that this *Begonia*, if placed in a cool window when in full bloom, will retain its blossoms all winter, while if kept in a warm room they will soon fall. Its habits are entirely different from any other *Begonia* that I am acquainted with. There is not heat enough for *B. Weltoniensis* and its class. As they do not blossom in winter, they would be put into the cellar but for the fact that they often die there.

Of course, *Orchids* are out of the question in a cool conservatory, and *Roses*, *Carnations* and *Violets* have not succeeded well with me. I am puzzled to know why *Geraniums* and *Nasturtiums* have not done better. The former stand almost still, and the latter grow so spindling that flowering is out of the question. Both are wintered for early-bedding plants merely. Even a badly attenuated *Nasturtium* will blossom out-of-doors ahead of plants direct from seed.

Fuchsias thrive in cool conservatories, but seldom flower till winter is about gone. I find *Storm King* too slender, indoors or out, but I have another and very vigorous variety with blossoms almost identical with those of that variety, so that its waywardness is not greatly regretted. Few plants repay wintering better than *Fuchsias*, for they can be rapidly multiplied by cuttings, and thrive in summer in almost entire shade.

Most foliage plants that do not form succulent stems do well in imperfect heat. The *Palms*, particularly *Kentia*, *Latania* and *Cocos*, the *Rubber-plant* (*Ficus elastica*), *Dracæna*, *Pandanus*, *Yucca*, etc., should be given prominence. Their only fault is that they often become too large for a small conservatory if many, and especially small plants are desired. They all thrive in an ordinary cool window. The true cultivator is always putting in small plants with slender lease of life, on which to experiment, with hope of nursing them into a flourishing state, and large plants interfere with this practice.

The more woody flowering plants do quite well with me. A pink *Azalea*, bought a year ago, is again full of flowers, and a *Cytisus* is putting out buds. *Hydrangeas* are quite at home. The *Heliotrope* does not remain stocky, but it flowers very well.

I am troubled by few insects except the green aphid. They are always present in some quantity, and but for tobacco fumigating would do great harm. At the risk of the charge of uttering heresy, I confess I am inclined to the policy of including a few plants in a conservatory that the aphid particularly likes. A few *Cinerarias* this winter have taken to themselves nearly every aphid in the whole conservatory. But for them these pests would have spread to the *Callas*, *Oxalis*, *Farfugium*, *Hydrangeas*, and, indeed, nearly everything but the *Begonias*. The *Cinerarias* do not flourish, but their decline is not on account of insects.

Buffalo, N. Y.

John Chamberlin.

The Constitutional Health of Plants.—II.

To the Editor of GARDEN AND FOREST :

Sir,—In April, 1890, on about an acre of land, I set Strawberry-plants between rows of Grape-vines in a young vineyard. These rows made equal plats, five yards apart, one hundred yards long. Three rows of Strawberries, three feet wide, were set in each of these plats and grown in matted rows. During the summer of 1890 Strawberry-blight (*Sphærella Fragariæ*) became epidemic over this entire patch of Strawberries.

In April, 1891, I sowed nitrate of soda broadcast, 250 pounds per acre, on the southern halves of alternate plats of these Strawberries.

In June the contrast between the treated and untreated plats in color and luxuriance of growth of plant and in yield and excellence of fruit was remarkable. Where the nitrate was applied the plants stood fully three times as high as those not treated, and they were of so dark a green that they were plainly distinguishable in color from the untreated plats at a considerable distance. The yield of fruit doubled under the nitrate and lasted longer, giving two more pickings of good berries.

On the nitrated plats there was not any blight, while on those without nitrate the blight was prevalent, as it had been on the entire field the year before. Late in August the fungus did appear on the treated plats, but the attack was slight.

I may mention also as instructive that on the plats not nitrated in April, 1891, nitrate soda had been applied in November, 1890.

From this autumn application no effects were visible; there was no improvement in growth or in fruit, and no exemption from the fungus disease; no difference in any respect between the portions of these plats nitrated in autumn and the portions to which the nitrate had never been applied.

This experiment teaches that—at least as a fertilizer for the Strawberry—the effect of nitrate of soda is immediate, but transitory, and that it is useless to apply it in autumn to leach out of the ground before growth begins next year.

Whether nitrate of soda directly destroys the germs of the fungus causing the blight I cannot say. When in late August this blight came on the plants which had been treated in April I gave a portion of one of them a free sprinkling of nitrate of soda. It blasted the foliage and stems and severely injured the crowns of the roots of the plants. A very weakly growth again started from them, but it was evident that the medicine thus administered is too strong for the patients' constitution.

As a preventive of Strawberry-blight it is probable that the nitrate of soda is effective simply by stimulating vigorous growth of the plant, strengthening vitality to a degree which enables it to resist successfully the attack of the disease. Among organized beings everywhere we see examples of this mysterious resistance of individuals to epidemic influences. Not all persons take the small-pox or the cholera.

Life contends against life, and it seems that the vital strength of the higher organism resists the vital action of the lower, but since we do not yet understand what life is, we can hardly consider this guess as an explanation.

In the case of various plants I have seen remarkable evidence of the benefit from the use of nitrate of soda applied to the soil just at the commencement of growth, or during its progress. And this benefit was especially noted in the comparative exemption of such plants from the attacks of insects and fungi.

It is essential, however, that the soil treated with nitrogen should be supplied with all the other elements of plant-food. Unless these be present the stimulus of the nitrate will be of little help.

Increased vigor of growth, secured without fertilization, sometimes seems to give the power of resisting disease. I have four *Kirtland Pear-trees* planted together in the orchard, which for years have been subject to attacks of the fungus, causing leaf-blight and the cracking of the fruit (*Entomosporium Maculatum*). By the last of August the leaves were all blighted and shed, the fruit was all cracked to the core and totally worthless.

These trees are thirty years old and were twenty feet high. When I learned that spraying with the copper solutions is protective against this blight, I arranged to spray these trees. To make them more accessible, and to more conveniently harvest the crops of fruit expected under this treatment, I cut back the tops of these trees, taking two-thirds of the length of each branch. This severe pruning was done in April, just as growth began. The trees pushed a vigorous new growth, making a dense mass of fresh sprouts and foliage. One of the trees was left unpruned, and it furnished a chance for comparison. For some reason the spraying was neglected, and

in late summer, when the Pear-blight was epidemic, severely pruned trees were not attacked, while the tree left unpruned was ravaged as usual by the fungus.

The contrast between the apparently perfect health of the pruned trees and the disease of the unpruned tree was vivid. The unpruned tree dropped all its leaves and pears in August. The pruned trees matured what fruit they bore, and held their foliage green until frost.

The next spring (1891) I left all the trees without any protective treatment. The unpruned tree was again completely desolated by the fungus. The pruned trees were healthy, maturing fine fruit and leaves.

Experiments hitherto have been chiefly made to test the efficacy of applications which serve as external defense to the plant against invasions of its foes. There is reason for hoping that we may make this protection more efficient by some fertilization or medication to stimulate and strengthen the constitutional health of the plant. We use special nutrients and tonics against epidemic diseases of the human family; there may be found other nutrients and tonics to promote the health of plants. The most promising of these are lime, potash and the nitrates and sulphates of soda and potassa; also sulphate of iron. With the exception, perhaps, of the nitrate of soda, to get the full benefit of these chemicals in promotion of plant-health, the plant requires some time to appropriate them to its uses. In my horticulture the beneficial effects of strong applications of lime and ashes given to plants three years ago are now just becoming apparent.

Vineyard, N. J.

A. W. Pearson.

The Danger of Delay in Acquiring Land for Public Use.

To the Editor of GARDEN AND FOREST:

Sir,—Mr. Harrison's letters on "The Shore Towns of Massachusetts" have possessed a vivid personal interest for me apart from their value as warnings against the danger of delay in securing public ground. Most of the area of which he speaks is familiar to me, much of it hallowed by associations of childhood and early life. It is not pleasant to reflect that I might now be ordered off as a trespasser from scenes which call up memories of friends and relatives whose honorable services have contributed to swell the maritime glory of Massachusetts.

But I wish particularly to enforce the lesson of these letters by specific examples. More than thirty years ago, when the late Nathaniel Silsbee was Mayor of Salem, he conferred with me on the possibility of preserving nearly the whole of the picturesque point of land then known as "The Neck," which separates the harbor of Salem from that of Beverly, the eastern point of which is spoken of by Mr. Harrison as "The Willows." It was then a rocky tract of utterly waste ground, with hills commanding magnificent views of the ocean, and containing the ruins of old Revolutionary forts. The only building on the tract was the almshouse, and it all belonged to the city. By request of Mr. Silsbee, after several discussions, I prepared a design for the arrangement of the larger portion of this tract as a public park, in which the old forts were included, and most of the ocean-front kept open for pedestrians, with a drive-way which in its course revealed all the finest views, while a large area outside was reserved for subdivision into building-lots for summer residents, who would be attracted to the place whenever it was thus improved. Mr. Silsbee made every effort to have the plan adopted, and urged upon the City Council the fact that here was one of the most attractive sites on the eastern shore, nearer to Boston by many miles than those between Beverly and Gloucester, which were then just beginning to be taken up for private occupation, and that Salem would thus secure a possession of unrivaled interest, besides making very valuable property of a then almost worthless piece of land. That was more than thirty years ago, and had the plan been carried out the drives and walks would long before this have been shaded by well-grown trees, and Salem would have possessed an unrivaled ocean park, that would have added a unique feature to those which her maritime history and quaint characteristics have already secured for her. But nobody could be brought to consider this other than a visionary scheme, and no action was taken upon it. The plan was returned to me, and I preserved it in the faith that time would vindicate the truth of its value, but it perished in the great fire of Chicago in 1871.

Another instance from my own experience is that of the Middlesex Fells, which Boston is now trying to secure after much of its beauty has been destroyed. It must have been as early as 1856 or 1857 that I invited a number of gentlemen to visit the place with me, and we spent an afternoon riding and walking

through the magnificent woods, over the picturesque hills, and on the shores of the beautiful lake of three hundred acres, on which only one house had then been erected. It was all wild, and could then have been had, comparatively, for a song, and I pleaded with all the argument I could command that it should be secured for the future use of the city and kept in its wild condition till wanted. The gentlemen who accompanied me were impressed with the beauty of the place, and to some of them it was a revelation that such a tract existed so near the city; but George S. Hillard, who was one of the party, doubtless expressed the sentiment of all when he said: "You might as well try to persuade the Common Council to buy land in the moon."

Such reminiscences may seem idle, but surely, experience ought to teach wisdom, and actual examples tell with greater force than general statements. The instances cited are only illustrations of what is happening to-day in every growing city, and in my forty years' experience as a landscape-gardener I have witnessed such lamentable results of the "peuny wise, pound foolish" policy that I feel impelled to sound a warning whenever opportunity offers.

Minneapolis, Minn.

H. W. S. Cleveland.

Apples for the North-west.

To the Editor of GARDEN AND FOREST:

Sir,—Mr. E. P. Powell's list of Apples may answer for the part of New York where he lives, but it is generally presumptuous for an eastern man to make out a list for "the north-west" or any other territory with which he is not familiar.

Seek-no-further is the only one of his list we can recommend here, and only for very favorable locations at that. Even this is better top-worked on Virginia Crab stock or Hibernial stock four feet above ground. We do not know Kirkland and Belle Bonne; if they are hardy we should like to try them top-grafted on Hibernial. Jonathan, Salome and Grimes' Golden we are trying top-worked. In 1854 we set out twelve acres of orchard, making our selection from the books and such other recommendations that would do well enough for New York, Ohio and Michigan, but we never raised a bushel from our northern Spies, Greenings, Roxbury Russets, Swaars and Wagners all put together. Having some recollections of New York Apples, and remembering Janesville was about on the same parallel of latitude, we foolishly thought it safe to plant such varieties as did well in our old home. Those eastern varieties grow too late, and do not ripen wood for winter. We want such varieties as Duchess of Oldenburg. We are fairly successful, with care, on good timber soil with Red Astrachan, Sops of Wine, St. Lawrence, Lowell, Yellow Transparent, Wolf River, Alexander, Fameuse, Wealthy, McMahan, Hibernial, Switzer, Longfield, Tallman Sweet, Newell's Winter, Roman Stem, Golden Russet, North-western Greening, Windsor Chief, Avista, Alden, Willow Twig, and many new seedlings that are coming to the front. Seven of these mentioned are Wisconsin seedlings, and have become standard sorts. We are much pleased with Patten's Greening and Iowa Beauty, from Iowa, and Peerless, from Minnesota. We are on the hunt for those varieties that will rival eastern fruit in quality and productiveness.

It is fashionable to decry Ben Davis, but this is the most profitable Apple that can be grown in the latitude of St. Louis, and a southern Ben Davis is not a bad Apple; grown at the north it is of poor quality. After some bitter experience, we are learning in Wisconsin that our best orchard sites are on the northern slope of timber clay ridges, with no protection except from south-west winds; that we should plant only hardy varieties, and trees grown at the north; that a tree should be pruned to one central stock, with side branches about eight inches apart at the time of planting; that every fruit or shade tree should be protected by a screen which shades the body summer and winter. This will protect from sun-scald and the borer, and the best protection against these, as well as against rabbits and mice, is a lath and wire screen, made by weaving lath with small wire, and encircling the tree with it. This will last eight years, and is the best and cheapest device we have found.

Janesville, Wis.

George F. Kellogg.

Notes.

In Philadelphia the Ulrich Brunner has been in greater demand than any other Rose this winter.

The house and garden of the late Alphonse Karr, on the Riviera in the south of France, have been purchased by some of his friends, and are to be preserved as a memorial of the

famous author, whose later years were entirely devoted to the cultivation of flowers.

In a letter testifying to the hardness of *Citrus trifoliata* in Philadelphia, Mr. Joseph Meehan writes that even the ordinary Lemon-tree will often survive the winters there when left out. One tree lived unprotected through two successive winters, after which record of it was lost.

Jedediah Hotchkiss writes to *Science* that while the Confederate soldiers were encamped in the vicinity of the Rappahannock River in 1862-63, not only they, but the inhabitants of that region, used freely the leaves of the common American Holly (*Ilex opaca*) as a substitute for tea.

The *American Architect and Building News* recommends, as likely to be of practical assistance to persons interested in the subject, a pamphlet on "The Disposal of Sewage for Isolated Country Houses," written by Wm. Paul Gerhard, C. E., and recently published by the Iowa State Board of Health.

More than three thousand persons are employed by the famous firm of Moët & Chandon in the cultivation of their vineyards near Epernay, the centre of the champagne district of France. The cellars in which the wine which they produce is stored, cover an area of about one hundred thousand square yards, and are cut out of the solid chalk beneath a hill.

Including the Central Park and the new parks in the northern portion of the city, which as yet are hardly available as such, the vast area of New York contains twenty-three breathing-places, large and small. In Berlin, in addition to the Thier Garten, there are three other large parks and about thirty open places, variously planted, and, even when very small, usually containing statues or other works of art.

Many Japanese flower-vessels are formed in the shape of a boat. Such vessels, according to Japanese ideas, must always be suspended in an elevated position in order both that the idea of their floating may be expressed, and also that the water they contain may not be seen; for taste would be grievously violated if water were visible inside a flower-boat, suggesting a leaking or wrecked vessel, and therefore giving birth to ominous suggestions.

A Philadelphia correspondent of the *American Florist* speaks of a new bright pink Carnation which is now being propagated in that city by Mr. Colflesh, and another light pink variety of Robert Craig's named Edna Craig, which is pronounced exquisite in color, of good size, and with a heavy stem. These two, with Mr. Lonsdale's Grace Battles, another promising pink variety which has been mentioned before, are soon to be offered to the public.

Professor Halsted, who has charge of the Exhibition of Weeds at the Chicago Columbian Fair, has sent out a circular requesting specimens from all states and territories. Seeds are especially desired as well as seedlings in various stages of development. The root-system, flower and flower-cluster and seed-vessel are also essential. If the weed is large, specimens must be procured while they are small enough to mount the whole plant, roots and all, upon a herbarium-sheet not over a foot in length. The collecting must be done during the present season, and the specimens sent in for mounting, labeling, etc., by the 1st of December.

Mr. W. R. Lazenby reports in the *Bulletin of the Torrey Botanical Club* that he has compared the catalogue of the plants of Franklin County, Ohio, published in 1891 by Messrs. Selby & Craig, with the list, covering the same district, which Professor W. S. Sullivant issued nearly fifty years ago, and which was considered a conscientious one at that time. The total number of plants now credited to the county is 1,002, as against 779 in the early catalogue. Of this total number fifteen per cent. are introduced plants; but when the additions to the old list, numbering 223, are considered by themselves the proportion of foreign plants amounts to nearly forty per cent.

A book likely to be of great value to tourists has recently been published in Paris under the title *Autour de Paris*. Its author is Monsieur Louis Barron, and it gives, in charming language and with much historical information, descriptions of all the interesting towns, buildings, landscapes and gardens in the vicinity of the capital, supplying a much-needed guide not only to such famous spots at St. Germain, Fontainebleau, Chantilly and Versailles, but to a multitude of others which, while almost equally delightful, are less celebrated, and therefore have usually been unvisited even by the most eager and industrious of foreign travelers. The work is published by Quantin.

Foreign papers describe an amusing exhibition which was recently held in the park at Brussels. The Burgomaster appointed a certain day when the sculptors of the city might display their skill in the rapid modeling of figures in snow, and the public would be admitted to view the results of their skill for a small admittance-fee, the money going to charitable objects. A number of sculptors entered the novel arena; by sunset their work was finished, and during the evening it was examined under the electric light by crowds of people. The most conspicuous work was a colossal figure representing Charity, while others were of a more "realistic" sort, notable among these being certain figures of nurse-maids and soldiers seated, after the manner of their prototypes, on the park benches.

The recently issued annual report of the Park Commissioners of Lynn, Massachusetts, is illustrated with charming pictures of the ground under their control, and it tells us that, although the town is a great manufacturing centre, the people who frequent the Lynn Woods "seem to have a sense of ownership which begets a feeling of care and responsibility for the property, which is a better protection than a police, however watchful, could give." Only three arrests were made during the year, and only one of them was for destruction of property, although the rules against breaking branches and picking flowers are necessarily strict; and no complaints of rowdiness or improper conduct were preferred. Prairie-hens and quail, introduced into the woods from the west, have made themselves at home and are breeding in a satisfactory way.

The Cauliflowers for which Erfurt is famous are grown on a low-lying strip of land some miles in length and intersected by warm springs which never freeze, even in this vigorous climate. The ground is cut into beds a hundred yards long by twenty wide, and the water flows around each in ditches about nine feet wide. The beds themselves are raised two or three feet above the level of the ditches, and the plants are watered with a bowl about the size of an ordinary hand-cup fitted to the end of a pole ten feet long, with which the water is taken from the ditches by hand and poured on and around the plants. This involves considerable labor during the hot summer months, but the plants flourish under such treatment and bring a very remunerative crop. Water Cress is grown in the ditches successfully, because the water is kept at an even temperature all the year round. Erfurt is one of the few places in Germany where Water Cress can be grown in quantity.

In Dr. Peter Heylyn's *Help to English History*, published at London in the year 1680, occurs incidentally an interesting bit of horticultural information. Describing the city of Gloucester, he says that the region where it lies is "a fruitful and a pleasant Country, being honoured with a full course of the River of Severn and the original fountain of the River of Thames. That part thereof which is beyond the Severn is overspread with Woods; all which included in one name, made the Forst of Dean. That part that butteth upon Oxfordshire is swelled up with hills, called the Cotswold hills; but these even covered, as it were, with Sheep, which yields a Wooll of notable fineness, hardly inferior to the best of England. Between these two is seated a most fruitful Vale, fruitful to admiration of all kinds of grain and heretofore of Vines and Vineyards; the want of which is now supplied by a drink made of Apples, called Sider, which here they make in great abundance." It certainly seems strange to-day to think of this western part of England as a region where cider was a comparative novelty, and where the manufacture of wine had been carried on.

Catalogues Received.

AMES PLOW Co., Boston, Mass.; Plows and other Farming Implements and Machinery.—WM. ELLIOTT & SONS, 54 and 56 Dey Street, New York; Vegetable and Flower Seeds and Bulbs.—WM. M. JOHNSTON, Wilmot, Stark Co., Ohio; The Daisy Force Pump and Sprayer.—C. H. JOOSTEN, 3 Coenties Slip, New York; Wholesale Trade Catalogue of Bulbs and Plants.—LÉNAULT-HUET, Ussy (Calvados), France; C. H. JOOSTEN, New York, Agent; Wholesale Catalogue of Nursery Stock.—RICHARD MOTT, Burlington, Vt.; Vegetable, Grass and Flower Seeds, Flowering and Foliage Plants, Trees, etc.—C. S. PRATT, Reading, Mass.; Price-list of Choice Strawberry Plants and other Small Fruits.—THE GEO. L. SQUIER MFG. Co., 189-195 Water Street, New York; Seeds, Roots, Plants, and Garden Requisites.—WM. STAHL, Quincy, Ill.; Fruit Trees, Plants and Vines; Excelsior Spraying Outfits.—PHIL. STRUBLER, Napierville, Ill.; Price-list of Small Fruit Plants.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLES:—Some Uses of Flowers.....	133
Poe's Cottage at Fordham.....	134
The Story of a Suburban Place.—I.....	134
Notes of a Summer Journey in Europe.—X.....	135
PLANT NOTES:—Erica hyemalis. (With figure.).....	136
NEW OR LITTLE-KNOWN PLANTS:—Clematis brevicaudata. (With figure.).....	138
CULTURAL DEPARTMENT:—Should Farmers raise their own Vegetable Seeds?	
The Greenhouse Under Trial.....	139
The Flower-garden.....	140
Petunia Blight.....	141
Success with Lilies.....	141
CORRESPONDENCE:—Spring's Onset.....	141
A Freak of a New England Orchid.....	142
PERIODICAL LITERATURE.....	142
RECENT PUBLICATIONS.....	142
NOTES.....	143
ILLUSTRATIONS:—Erica hyemalis, Fig. 21.....	137
Clematis brevicaudata, Fig. 22.....	139

Some Uses of Flowers.

AN article on this subject by the learned agriculturist, Pierre Joigneaux, originally published in the *Journal de la Ferme*, founded by him, and since his death reproduced in the *Revue Horticole*, has suggested some thoughts about the uses of flowers and the part which they play in our lives. Monsieur Joigneaux claims that the love of them is one of the important differences between man and the brute, but, unfortunately, modern science reveals that, after all, the primary cause of the color and fragrance in flowers was to make them attractive to birds and insects; and as the Poppy-bee and Australian bower-bird manifest quite as keen an appreciation as we do of their decorative value, the Frenchman's theory has no more substantial basis than the vainglorious assumption that the universe was made for man, and that he is superior at all points to other created things. But admitting all this, no sufficient reason why we should disparage or undervalue any pleasure is to be found in the fact that our lowly relatives, in their humbler way, can enjoy it, too.

It is an open question if the delight of the eye can ever be reckoned among the intellectual sensations, but whether the power to appreciate beauty is classed among our higher or lower faculties, the truth remains that flowers are relished and employed by man for ornament, even in his savage state, and this taste is not outgrown, but rather strengthened, as he advances in refinement, until in the great cycle of development the most highly organized civilization again touches the barbarian plane, in its love for sensuous enjoyment. The gratification of the human eye and nose being presumably more elevated than the joy of the donkey in his Thistle, or the humming-bird in its Bignonia, we are apt to plume ourselves upon this taste for flowers as an evidence of inward refinement, which it may or may not be, according to circumstances. A Nero may delight in his crown of Roses, while a Tarquin prefers to whip off the heads of his Poppies in a bloody dream of

tyranny, without leaving much to choose between them in ethical quality. But, however this may be, the love of flowers has a charming sentiment about it which gives it a high rank among the material sources of satisfaction; and the tendency of their presence to brighten and cheer lives otherwise devoid of color and fragrance touches our sympathies and gives food for the imagination. Thus the row of flower-pots in a cottage-window appeals to us more than the stately conservatories of a rich man's dwelling; the child's garland of daisies more than the belle's bouquet; the lilies on a coffin more than the roses that surround the bride; yet all are appropriate and precious, and cannot well be spared.

But, apart from what might be considered mere sentiment, flowers have played a considerable part in the history of civilization. They have given standards both of color and form that have had from the beginning a profound influence upon the plastic arts. They were probably the earliest suggestion of color to man, and from their roots, as a natural source, were distilled the earliest dyes. The Egyptian column is a reproduction of the stem and blossom of the Lotus-flower, at first realistic in shape and hue, and later conventionalized into that noble and beautiful form which still exists in the capitals of their majestic temples. The volutes of the Greek Ionic order, the Acanthus-leaf of the Corinthian, were suggested by common weeds. Gothic art borrowed from the garden myriads of lovely forms that were carved in stone into undying wreaths of beauty. Even the Hebrew, so reticent in natural form, was permitted to use the Pomegranate as a design upon the garment of the high-priest. The goldsmith has fashioned flowers in gold and silver, the lapidary has turned jewels into their likeness, the smith has reproduced them in miracles of wrought iron, the sculptor has modeled them upon his pedestals and adorned his statues with their semblance, the painter has borrowed from them his choicest decorations. To the poet they have been an unfailing spring of suggestion, whether as symbols or as a theme for dainty verse; the wisest and the gayest of the bards having alike immortalized them in powerful rhyme. Wherever art exists, whether of form or thought, flowers have been a potent spell to conjure with.

Thus from the earliest ages the life of man has been enwreathed with their fair forms, crowning him at banquets, smiling at him from his walls, twining around the columns and altars of his temples. They have expressed his love, his joy, his worship, his regret, his poignant anguish, in reality and symbol. The Greek hung a wreath upon his mistress's door; he wreathed the wine-cup with Roses, the victor with Laurel, the poet with the Bay, the guest with garlands; he crowned sleep with Asphodel, and death with Amaranth. This universal use of flowers almost seems to justify the belief that a love for them is one of the original passions of the human soul. No one who gives a handful of wild blossoms to a street child, whose life has been passed on a desert of stone, can fail to note how eagerly they are taken, and how tenderly, almost reverently, they are treated. Do the flowers satisfy a genuine hunger of the heart, or is this one manifestation of that larger affection, that feeling of kinship with all living things, which, in its various developments, we call the love of Nature?

Perhaps, however, the kindest office of flowers to man has been to inspire him with a love of gardening, a humanizing pursuit wherein their pleasant companionship affords unwearied delight. Here is a homely pleasure for all classes of people, from the road-side cottager, with his handful of Pinks and Roses, to the grower of all rare and splendid exotics. Here is a pursuit which beguiles the young into study and the old into congenial labor; which offers profound problems to the wise and simple pleasures to the unlearned; a resource which never fails; a delight which never stagnates into monotony, but leads on to new and ever-expanding fields as the seasons change and the years grow.

IT is to be regretted that a small fund cannot be raised to purchase Poe's cottage at Fordham and remove it, for perpetual preservation, to one of the new parks near by. "Until last autumn," says a recent writer in the *Epoch*, "the cottage had been kept in comparatively good repair by a widow, a woman of culture, who took great pride in the place and lived in the house. But the lady moved away on account of ill health, and a 'To Let' sign is now tacked on the cottage. The wealthy residents of this neighborhood look upon the little pastoral home as an eyesore, and are tired of answering the many questions constantly asked regarding it. The cottage looks forsaken; the doors are barred; across the windows are nailed boards, and everything about the place is going into decay. As it was opened for me a few days ago, there was a musty and damp smell about every room. The thin floor is giving way, and the ground beneath exhales a malarial dampness through the room where Poe wrote, and even the humblest people will not live in the house, owing to its unhealthy condition. I was told that the place was still visited by nearly a thousand people each year during the spring, summer and autumn months, and everything is pointed out: the room where Poe wrote his 'Annabel Lee,' and where, on January 30th, 1847, death released his child-wife, Virginia Clemm, from her period of suffering. But the historic pastoral cottage has seen its day, and, with the march of progress, it will soon be demolished, and its existence serve only as a memory, and to be told of by the 'oldest inhabitant' in the years to come." This is a very new country, and it will grow into a riper and more mellow age if some of the links which connect it with its earlier history are preserved. We therefore commend this interesting cottage in its distress to the literary men of New York, in the hope that some existing club or some special association of public-spirited men may be induced to rescue it from threatened destruction.

The Story of a Suburban Place.—I.

IN one of the large suburban communities just out of Boston, something like ten years ago, there was a wild-looking piece of land that rose abruptly from the street. A fringe of houses stood along the highway, but back of these there rose a wilderness of ledges and woods. An unkempt lane branched from the street here and curved up the slope. At the point where this stony byway disappeared from view, looking up from the thoroughfare, a picturesque house snuggled up against a Pine and Savin-covered ledge.

Few persons then appreciated the real value of land like this, and population for the most part had kept to the level ground. The lot was long and somewhat narrow, running from the lane beyond the point where it curved around nearly to a parallel with the highway below, and running down-hill to within a hundred feet or so of the street. It had an area of something over 30,000 feet, and was bought at a moderate price.

The land, mainly a rugged ledge, sloped abruptly both to the eastward and southward. A former owner had cleared most of the wild growth away, with the exception of that about the ledge, and had planted an orchard on the southern slope, where the neglected trees were making a slow growth. The land on either side had, for the greater part, also been cleared, but was mostly covered with a young second growth. The country, to the northward, was an almost unbroken wilderness of wooded hills, from which most of the timber had been cut twenty years before. This wilderness, near the lot, had been laid out in streets, which rambled in pleasant curves among the hills, and a little grading and blasting had been done, but the grades, for the most part, were fearful in their steepness.

Suburban street-railways were then unknown, and the nearest steam railway was almost a mile away from the greater part of the region, and the property had lain idle; but over the railway that accommodates this suburb there are now probably more trains in one hour than then passed over the line in the course of the entire day.

A third of the lot near the lane was sold to a friend for the sake of having a good neighbor, with the drive-way reserved to give access to the remainder. The site for the house was easily chosen. The considerations were, beside accessibility, the best possible view, together with plenty of sunshine and shelter from the cold winds. The southerly slope, close to the

ledge, seemed an ideal situation. The hill, rising behind, cut off the sweep of the northerly and north-westerly winds, while the prevailing winds of summer were from the southward and south-westward. The view was superb, commanding an uninterrupted range over something like two-thirds of the horizon.

The architect entered happily into the spirit of the scene, and made the best of his opportunities. The house composed admirably with the location. It was a two-story cottage of eight rooms, with basement of stone, furnished by blasting out the ledge for the cellar, the greater portion of three sides of which were above ground, on account of the slope. The wide-angled gables and broad eaves gave the house something of the Swiss character that harmonized with the rugged location. It was decidedly picturesque, with the merit of no uneasy striving for picturesque effect. Not a little amusement was afforded by the comments of towns-people who watched with interest the building operations. "No two windows alike, and not one of them over another. It's a sight to behold," said one. "How are you ever going to get there?" "How do you expect to get water on top of that hill?" were other queries.

The approach, however, was gradual enough, around by the lane and the drive-way, though looking directly up from the highway the house did tower up startlingly. The grocer's men and the like, together with casual visitors, always came toiling straight up across lots, and were pretty well winded on reaching the door. But, in spite of the commanding view and the impression of towering height conveyed by the almost precipitous relation of the site to the street below, the elevation was only about sixty feet above sea-level, and something like fifteen feet less than that above the main street. As to the water question, since the source of the town-supply was about twice as high as the ridge-pole of the house, no difficulty was experienced.

The house proved as pleasant and convenient as it was unconventional. The windows were made broad, so as to admit as much light and sunshine as possible. More wall-space was gained in the rooms, and concentration of light, together with the effect of bay-windows without the expense, by bringing the windows in the living-room and dining-room close together at the corners. The hall was made large, with a fire-place opposite the door, and an entrance to the sitting-room by double sliding doors that were seldom closed it was practically a portion of the living-room, which thus was about doubled in size. A projection of one story, which gave a pleasant variety to the exterior, was devoted to a small library and study, but there proved to be some objections to a study off the hall, even in that quiet neighborhood, and the establishment of a den in a portion of the yet unfinished attic space is contemplated.

The windows were left without blinds, which are rattling nuisances. In that breezy place the sunlight seldom becomes oppressive, and in the summer sufficient shade is given by awnings, which aid in agreeably clothing the house. The common American awning, however, is a hot-air trap, holding the heat in its hood like a hot-air balloon. Therefore the example of Mexico and other southern countries was followed by making the awnings a foot or so wider on each side than the windows and not closing in the sides, which gave ample shade and allowed the hot air to escape freely.

It seems a pity, however, that the most of us are debarred from making application of the experience gained in building a house by building over again and carrying out the ideas thus gained. One thing learned is that all windows should be casements, after the sensible continental European fashion, so that the benefit of the full air-space of the window-opening may be had whenever desired. We Anglo-Saxons have carried our sliding window-sashes into all parts of the world that our race has colonized; even the most unsuitable climates, like Bermuda, the British West Indies and California. In those warm climates, where all the air circulation is needed that can be obtained, half the window-space at least must thus be closed by glass. The same holds true of our northern American summers, which, with their humidity, often give us the additional annoyance of causing the sash so to swell in its frame that the utmost exertion cannot stir it, thus depriving us of fresh air altogether. It is possible now to construct casement-windows so as to be as tight as needed. The ideal window is a double casement, with the outer one so constructed that the frame will hold glass in the winter, to be removed in summer and replaced by wire netting to keep out the flies and mosquitoes.

The lower story of the house was clapboarded, and the upper portions were shingled, and the whole painted. The colors are harmonious, and the paint has stood phenomenally well, looking practically as fresh to-day as when applied nine years ago. But if the house were to be built again it would be plas-

tered externally. In this way a more substantial effect is gained, and the considerable expense of periodical repainting may be avoided. It would also greatly increase the warmth of a house in winter. Plaster has been proven to stand our climate admirably, and it seems the best possible material for country-house exteriors. A variety of effects may be gained by using either rough-cast or smooth plaster-work, or by mixing any desired coloring matter, like brick-dust, for instance, in the plaster. The surface may also be colored by wash or paint. Painted wood when weather-beaten looks shabby; painted plaster becomes picturesque with its delicate tones, like the effects in Spanish-American cities. Another advantage is the freedom with which climbers cling to the surface, while they have usually an unconquerable repugnance for painted wood. Next to plaster comes a shingled and unpainted exterior, which, assuming very quickly a soft stone-gray, makes a house look as substantial as stone, and gives it a rightful place in a rural landscape. Climbers will cling readily to the shingles. Pleasant effects are also gained by the use of stains on the shingles, which may be easily renewed, or, better still, may be left to blend under the weather. But a shingled exterior should never be tidied up with paint. Clapboards are almost hopelessly prosaic in effect.

The piazza on the easterly side of the house makes substantially an outdoor room for summer afternoons and evenings. It is of generous width, and covered at the entrance. Adjoining the living-room, which communicates with it by casements, it is roofless, but an awning affords all necessary shade. A piazza should never be permanently covered on the sunny sides of a house where there are windows.

Here on the piazza there are blossoming house-plants, together with a large Oleander in a tub. A rug is spread beneath the awning; there are tables and chairs, and supper is sometimes served here. The view is a source of unwearying delight. So abruptly does the southward slope fall off that the immediate foreground is not visible except from the edge of the balustrade, making the effect of the piazza much like that of the hurricane-deck of a steamboat. The range is from Nahant to the eastward, around to the Menotomy Hills, in Arlington, to the westward. The central point is the State House, with its glittering gilded dome, five miles away as the crow flies. The great city spreads on all sides, its political limits indistinguishable as it merges in the mass of the Greater Boston that extends to our feet. Our hill-side forms part of the ancient rocky coast of the Boston basin, and a rise of but a few feet would again bring the salt-waters of the bay up to its former shores. It is hardly more than a stone's-throw down into the level of the wide alluvial plain over which the tides once rolled. This plain spreads away to the blue gleam of the Mystic. When the house was built it was an almost unbroken pastoral expanse, dappled here and there with trees, and broken with woodland areas, the successors of the noble Oaks that went long ago to form the timbers of the East Indianmen launched from the Medford ship-yards. Last year all but a patch of the woodland vanished before the axe, for it was there that the Gypsy Moth began its ravages, and the remedy was to destroy the trees.

Very soon after the occupation of the hill-side the plain began to be checker-boarded with streets, and houses began to dot themselves over it. The effect of these packing-box structures was most discordant at first. But as they multiplied, their isolated ugliness vanished as they became merged in the mass that soon covered the ground and joined itself to the sea of buildings that spreads in broad undulations over the hills and valleys of our rapidly growing suburban city, blending indistinguishably with the neighboring municipalities that ultimately must become one. The commonplaceness of urban edifices gives way to a striking impressiveness when beheld in a mass, with a confusion of roofs and gables intermingled with the verdure of tree-tops that nearly bury them for half the year, visibly symbolizing the efforts of Nature to overwhelm the works of man and reconquer the ground he has made his own.

There is one broad space where the sea of houses holds back—a wide expanse of salt-marsh like a grassy lake. At times the silvery threads of its embroidering creek swell and spread until the marsh becomes for a brief time a veritable lake—a beautiful vision as ephemeral as the sunset's glow.

The view includes some notable historic details. Less than a mile away by the Mystic's side may be seen the roof and chimneys of a brick dwelling, the oldest house in New England, and in the United States outside of the once Spanish domains of Florida and New Mexico, the mansion built for Governor Cradock, but never occupied by him. Near by was launched in 1632 the Blessing of the Bay, the first vessel

built in New England. Beyond the Mystic rises the picturesque old pre-revolutionary powder-tower in Somerville.

In Charlestown the great shaft of Bunker Hill monument is rivaled by the more slender chimney of the Navy Yard machine-shop. About the huge bulks of the grain-elevators in Charlestown and East Boston are congregated the masts of the shipping in the harbor; the harbor itself cannot be seen from here, but the long blue line of the Atlantic shows over Nahant from the ledge above. At night the red glimmer of Egg Rock light may be seen from the piazza, and from the upper windows are visible the steady glow of the lighthouse on Long Island head, and the intermittent flash of Boston light at the harbor mouth.

The contrast between the life and stir of the metropolitan landscape in front, where the city is backed by the majestic wave-lines of the Blue Hills, is great. The smoke rises from countless factory-chimneys; the fleecy steam-drifts mark the flying shuttles of five lines of railway; the incessant hum of traffic comes faintly to the ear; then the almost absolute seclusion roundabout, with the sylvan wilderness rolling away behind. By our neighbor's house, just below and across the way, the pioneer of our friendly group of three, there nestles a pretty lakelet among the fells, its calm surface glimpsed from the piazza above the tops of the Apple-trees that happily cut off the sight of a row of prosaic dwellings. This lakelet, which occupies a former swamp and forms a reservoir for the great factory of our suburb, occupies the hither end of a valley along which there is a vista to some hills—far enough away for a soft haze to intervene—that stand in a park now private, though likely some day to become a public domain.

The changes of the day and night lend constant charm to the landscape from this piazza—its aspects under sunshine and cloud, under summer verdure and winter snows, the flushing tints of spring-time leafage that seem prophetic of the vivid tones of autumnal glory; the sweet languor of summer nights with a mystery of darkness below and above, the city lights far and near repeating the firmament's constellations almost as though mirrored in a lake, and the enchantment of the moonlight scenes, under which the plain sometimes becomes transformed into a white sea of mist, with the dim and vaguely outlined bulks of trees and buildings rising darkly from the surface like the islets of an archipelago.

Boston.

Sylvester Baxter.

Notes of a Summer Journey in Europe.—X.

FROM Berlin an excursion was made to Copenhagen with the object of comparing the dendrological collections of this northern station with our own, so that, if found worth while, arrangements for exchanges might be made. Although Copenhagen is situated in a latitude which corresponds to that of north-eastern Labrador, it enjoys a somewhat insular situation and reaps much benefit from the modifying influence of the great Gulf Stream. From the character of the vegetation I was prepared to find indications of a winter climate somewhat similar to, or a little colder than the winters in eastern Massachusetts. It was quite a surprise, therefore, to find here trees of the English Walnut, good specimens of *Sequoia gigantea*, to be told that *Vitis vinifera* matured fruit in some favorable situations, and to see thick borders of *Fuchsia Riccartoni* and *F. gracilis*, two or three feet high and in full bloom, which remain out all winter with only a moderate covering of leaves and rubbish. Even the Fig can be grown against walls if afforded winter protection. When the mercury falls to about zero of Fahrenheit at Copenhagen the weather is considered extremely cold. Therefore it is possible to grow here many trees and shrubs which will not survive the winters of eastern Massachusetts.

There are practically two botanic gardens in Copenhagen, each being under the control of separate institutions. These are the University Botanic Garden and the gardens of the Royal Agricultural and Horticultural Academy. The first presents no novel features and few remarkable plants, or plants which are not to be found in the other. It was of interest to note here both the typical and the yellow or amber-colored fruited Choke Cherry (*Prunus Virginiana*), sixteen or eighteen feet in height and with thick single stems. In many parts of America the Choke Cherry is counted as a mere shrub, but in some places it really becomes a neat single-stemmed tree, so that, from its habit, it might almost be counted a distinct species from the shrubby race. The yellow-fruited form is apparently quite uncommon, and to it has been given the varietal name of *erythrocarpa*. In this garden there are fine shrubs of *Jamesia Americana*, while handsome masses of the so-called Oregon Grape (*Berberis Aquifolium*) were bearing an abundance of fruit. *Lonicera alpigena*, about seven feet in height, was very showy, with large rich red fruit. The plant which inter-

ested me most was a flowering specimen of what I at first took to be a white-blossomed *Potentilla fruticosa*. It was without name, and no information could be obtained concerning it. In making inquiries afterward at various botanical establishments and of persons eminent for their knowledge of such things, no one seemed to know anything about it. The plant was seen again in the Edinburgh Botanic Garden. There seems to be no doubt that this is the *P. glabra* of Loddiges, or what has also been called *P. Dahurica*, small colored figures of which are to be found in *Loddige's Botanical Cabinet*, t. 914, and in *Gartenflora*, vol. ix., t. 278. It is said to have been introduced from Siberia, and is, therefore, a plant which should be perfectly hardy in all northern gardens. It was early introduced into cultivation (in England as early as 1822, according to Loudon), and it is hard to tell why it should have been allowed to become almost lost again. It grows to about the same size as *P. fruticosa*, from which it chiefly differs in its white flowers, and in being smooth in all its parts instead of pubescent or hairy.

The gardens of the Royal Agricultural Academy were established about thirty-two years ago, and are now mainly under the general charge of Dr. C. Hansen. Necessarily they include much more than the other, and, besides the natural species of ligneous plants, portions are devoted to experimenting with and growing of fruits, vegetables, cereals, etc., work necessary to an institution of this kind. Here, also, new varieties are tried, practical tests of the value of manures made, and other experiments carried on which may prove useful to the students.

This garden is interesting and instructive in various ways, and the grounds and specimens present a very creditable appearance, especially considering the very moderate sums allowed for their maintenance. For popular instruction there are separate beds made for plants of economical interest, so that the different species may be seen together, which are valuable for any particular quality. In this way instructive object-lessons are given in textile, food producing, sugar producing, gum and oil producing, aromatic, tinctorial, medicinal, poisonous, and other classes of plants likely to interest not only trained students of science, but every one at all interested in these subjects. All the species are very distinctly and neatly labeled, each with its botanical and common name, its original habitat and the peculiar property or quality for which it is noted. A feature, not often carried out to such an extent in other economic collections of this kind, is the exhibition of the seeds and sometimes of the products with the living plants. The seeds are first thoroughly dried, then carefully sealed in specially made jars, which are then placed in an inverted position on a suitable stand or support beside the living specimens. Characteristic fruits or products are also sometimes shown in liquid. Such a collection of bottles and jars with the plants does not give a pleasant aspect from the artistic point of view, but genuine educational advantages are thus afforded. Considering their limited area and how much ground is necessarily set apart for strictly practical or educational work, the grounds of the Academy contain a fair collection of trees and other hardy ligneous plants. *Holodiscus* (*Spiræa*) *discolor*, *ariæfolia*, has become a handsome bush, fifteen feet across and twelve feet high, and the mild moist climate has induced many other shrubs to grow in corresponding proportion. The plant given the name of our Smooth Sumach (*Rhus glabra*) was not that species, but seemed more like the Stag-horn Sumach (*R. typhina*), and may possibly be a hybrid between the two. This is mentioned here because the true typical *R. glabra* was not seen in any European garden visited by me, although in some gardens the cut-leaved variety (var. *laciniata*) is cultivated. *R. typhina* is common. The intermediate form, usually called *R. glabra*, also goes by the name of *R. viridiflora*.

Another very different species of *Rhus* is passing as *Ampelopsis Japonica*, but its trifoliate leaves, rooting stems and milky juice at once indicate that it is a *Rhus* very closely allied to, if not identical with, our Poison Ivy (*R. Toxicodendron*). This so-named *Ampelopsis Japonica* has been distributed as a novelty by a well-known English firm, and in Germany I found it planted as something choice to form a covering for the supports and sides of a much-used arbor.

The tips of the branches of the Plane-trees here seemed affected by some disease which caused injuries similar to that caused by the fungus in America.

The director of the garden has made some attempt at a geographical arrangement of his plants, and in the little space devoted to the flora of Greenland there are several woody plants which have been brought from that cold region. Perhaps the most interesting of these is a fruit-bearing specimen of an American Mountain Ash.

In labeling the trees white porcelain labels on iron stakes are much used, but plain zinc labels are also largely employed, while others of a more elaborate kind are furnished with a little map showing the geographical distribution of the species.

In this garden and vicinity there are fine hedges of English Hawthorn, Box, Privet, Hornbeam (*Carpinus Betulus*), and a beautiful close compact one, ten feet high, of the European Field Maple (*Acer compestre*).

One of Dr. Hansen's hobbies is conifers, and at the Arboretum, or Forest Botanic Garden, at Charlottenlund, several miles out of Copenhagen, he has been enabled to accumulate a larger collection of these than is possible in the city garden. This experimental arboretum only covers eighteen or twenty acres of ground. It is said to have been established over fifty years ago, and it is now practically a branch station of the Agricultural Academy. Although much crowded, some of the trees have attained a good size. Among other evergreens there are large and fairly well-developed examples of *Sequoia gigantea*, *Abies grandis*, *Picea Sitchensis* and *Pseudotsuga taxifolia*. The last is counted the fastest-growing. A tall specimen of *Alnus glutinosa*, with a trunk two and a half feet in diameter and the aspect of a sturdy Oak, is one of the finest trees on the place. Laburnums do well here, while such American plants as *Ilex verticillata*, *Amelanchier Canadensis* and *Viburnum prunifolium* are quite as well grown as any to be seen in cultivation. Of the conifers, the director's specialty, it is claimed that there are about six hundred species and varieties here. The plants are mostly still very small, and, of course, there is not room for any sort of development in size. Such an extraordinary number of so-called varieties is accounted for by the fact that extremely slight variations are recognized and propagated. Of Lawson's Cypress, for instance, there is said to be at least fifty-two different kinds. Most of these forms are of no particular value or interest except to a student or enthusiast. It is claimed that they vary in point of hardiness, but a greater difference would undoubtedly be found by selection from natural habitat.

The scope of these notes will not allow of a more extended notice of the Copenhagen gardens. While not differing enough from other gardens to make a long journey worth the while, they deserve a visit by any one interested in botany or horticulture who may happen to stray into this region.

The Beeches of Denmark are far-famed, and many fine Beech and Oak forests are frequently seen. It is said that there are only two species of conifers now indigenous to the country. These are the common Juniper (*Juniperus communis*) and the Yew (*Taxus baccata*), the latter being very rare and local. That the climate and soil of some parts of Denmark are suitable to the growth of trees and arborescent vegetation is shown in a fine forest at Klampenborg, a few miles north of Copenhagen. Here the common European Silver Fir (*Abies pectinata*) is to be seen with beautiful stems a hundred and twenty feet in height and three or four feet in diameter as high as one can reach from the base. These trees were originally planted alternately with rows of Beech and Oak.

Practical forestry receives some attention in Denmark. Large areas of the waste lands are annually planted with the little Mountain Pine (*Pinus montana*), so that eventually these now worthless tracts may prove of value, and, in the process of nature, obtain some degree of fertility.

Arnold Arboretum.

J. G. Jack.

Plant Notes.

Erica hyemalis.

FIFTY years ago there were between three and four hundred species and varieties of Cape Heaths in cultivation in England. They were popular with amateurs, collections of them being as frequent almost as collections of Orchids are now. Few of these Heaths remain in our gardens. As a rule, they are disliked because they require too much attention for the ordinary collection, while for specialists the genus has apparently lost its charm. There are, however, at least two *Ericas* which have kept a leading place among popular garden-plants—namely, *E. hyemalis* and *E. gracilis*. With regard to the former, it may be said with truth that no other plant is grown in such enormous quantities for the London market. At least a dozen nurserymen might be named whose annual output of this one Heath amounts to from twenty to thirty thousand plants each. Such a specimen as that represented in the illustration on page 137

may be bought in Covent Garden market about Christmas-time for eighteen pence. The plants are usually in five-inch pots, and the shoots average a foot in height. The flowers

perish almost as soon as the flowers—that is, all those which find their way into the window of a house or into a small greenhouse. And this accounts for the enormous



Fig. 21.—*Erica hyemalis*.—See page 136.

remain fresh for at least a month. The popularity of this Heath is thus easily accounted for: it is cheap, very pretty when in flower, and lasts just long enough to satisfy the masses who like window-plants and change. The plants

number disposed of every year. In England *E. hyemalis* is certainly one of the most valuable market-plants ever introduced.

It is strange that a plant which has enjoyed an excep-

tional popularity in England for something like fifty years should never have been figured in any English publication or work until now. I have not been able to trace the origin of the plant, nor find any picture of it in any book to which I have access here. Nor can any of those who have paid attention to garden Heaths assist me. The venerable Mr. John Fraser, of the Lea Bridge Nursery, once famous for its Heaths and New Holland plants, informs me that he purchased three plants of it from the Pine Apple Nursery about forty years ago. Cultural directions for this and *E. gracilis*, I find, were given in the gardening papers of thirty years ago. Probably the plant is a seedling or hybrid; at any rate, it is not represented among the wild specimens in the Kew Herbarium. It is not mentioned by Andrews in his beautifully illustrated work, *Colored Engravings of Heaths*, published in 1809. Singularly enough, Andrews states, under *E. Linnæa superba*: "This fine plant has ornamented various collections for the last five or six years. In growth it is luxuriant, as we have frequently seen it two feet high with numerous long-flowering branches at Covent Garden among many of the most beautiful (if not most rare) *Ericas*, which are exclusively cultivated for that well-known emporium. It may certainly be considered as one of the finest variations of *E. Linnæa*, and as such its hyperbolic specific title may serve to distinguish it from most varieties." Were it not that the plant thus described is stated to flower in "May, June and July" I should have accepted this as being identical with our *E. hyemalis*. In Loddiges' *Botanical Cabinet* (t. 102) there is a figure of *E. Linneana*, which is there stated to "flower rather early in spring and is of pretty long duration. We consider it a very ornamental sort. The buds are in general formed before the winter, and if it is kept in a bad greenhouse, where the smoke escapes from the flues, the buds are very apt to blight. We have known them preserved exceedingly well in a frame, carefully attended to in winter." In my opinion, *E. hyemalis* is somewhere very near these two. In De Candolle's *Prodromus* both *E. Linneana* and *E. Linnæa superba* are referred to *E. perspicua*. This species, as now known, flowers from April to November. It was introduced from the Cape to Kew about one hundred years ago. Several varieties of it are known, and, if the *Prodromus* is correct, we may conclude that *E. hyemalis* is probably a winter-flowering variety of *E. perspicua*. It is difficult to believe that the raiser of such a plant would not have claimed some credit for it. So much for what we know of the origin of this beautiful Heath.

In its cultural requirements *E. hyemalis* is simple enough, but the grower must stick to those requirements or he will certainly fail. In the nurseries of Messrs. H. Low & Co., where about thirty thousand plants such as that figured are annually grown, the method of culture for this Heath is as follows:

PROPAGATION.—Cuttings are selected in September or October from the branchlets which crowd the base of the plants. They are cut to an inch in length, and the lower half is carefully stripped of leaves. The cuttings are then pricked in well-drained seven-inch pots of very sandy peat-soil and covered with bell-glasses. The pots are placed in a north house, where the temperature is kept at from fifty-five to sixty degrees. The bell-glasses are removed and wiped inside every morning, and any pots which require water obtain it then. The bell-glasses must not be replaced until the water has drained off the cuttings. When struck, the bell-glasses are removed and the plantlets are gradually hardened off. After they have made about half an inch of new growth they are topped with scissors.

FIRST POTTING.—This is done in spring when the cutting-pots are shaken out and the plants placed three in a pot. The pots used are small, known here as thumbs (two and a half inches), and the soil is a mixture of dark peat and sand, equal parts of each. When potted the plants are placed in frames and kept close and shaded for a few days. After twelve months in trios, as above, the plants are ready for removal into separate pots. These are thumbs, as be-

fore; the soil used is the same as before, but less sandy. It is a good plan to stake the plants before they are shifted, a stout deal-stake five inches long being given to each. When potted, place the plants back in the frame. Pinch out the tips of the shoots again after a little growth has been made.

FINAL POTTING.—If the treatment hitherto has been right the plants ought now to be sturdy little bushes with from eight to a dozen short shoots and a thick net of white roots. In December or January they may be potted into four or five inch pots. The soil must not be of the light brown character, such as is used for Orchids, but good black-brown heather-peat. It should be broken up roughly and mixed with silver sand. In potting the soil should be pressed down firmly with the hand. Potting-sticks should not be used. The frames are still the most suitable place for the plants, where they must remain till the middle of June, when they may be placed in the open. A position exposed to full sunshine all day is indispensable. Beds, say, four feet wide, formed of ashes, are best, the plants to be stood upon or half-plunged in the ashes.

TEMPERATURE.—This Heath dislikes artificial heat. If frost can be kept from it by protection, and if light can be given occasionally in severe weather, the plants will be much healthier than if fire-heat is used. At Clapton the Heath-frames are made of wood, span in shape, eight feet across, four feet high in the middle, with movable lights; a two and a half inch hot-water pipe runs once round the frame. The lights are removed when the weather is not cold, even in midwinter, except for a few weeks after re-potting. Mats are thrown over the frames in severe weather. The golden rule to be observed is that fire-heat and a close atmosphere are distasteful to this Heath, and that sunshine and plenty of fresh air are its glory.

WATER.—Don't water a Heath till it is dry, and then soak it, is the maxim with growers of these plants. Absolute dryness, however, is dangerous, and often fatal. The plants should not be allowed to "flag." In very dry weather it is advisable to look over the beds twice a day, watering those that are dry only. Manures, such as nitrate or soot, are given when the plants are in vigorous growth. Be careful in the use of stimulants, or the result will be strong shoots, but all "blind" in respect of flowers. Beside the type we have two varieties—namely, *superba*, larger-flowered, and *alba*, paler in color.

London.

W. Watson.

New or Little-known Plants.

Clematis brevicaudata.

THIS pretty Asiatic species, figured on page 139 of this issue, is a decided acquisition to the climbing autumn-flowering plants which can be cultivated in northern gardens. Botanically it is closely related to the familiar Virgin's Bower of our eastern meadows, and, like that species, belongs to the section *Flammula* of the genus, distinguished by cymosely paniced, diœcious, apetalous flowers with white spreading petaloid sepals and stout blunt anthers. It is a graceful plant with slender stems climbing ten or twelve feet high, puberulous, dark green, ternately divided leaves, their divisions long-stalked and divided into three ovate-acute leaflets sharply and deeply cut above the middle, entire and gradually rounded at the base, or three-lobed, and sometimes almost entire. The flowers are produced in ample pubescent panicles rather shorter than the leaves, and open during the first half of September; those of the pistillate plants are followed by abundant showy fruit with bright brown akenes covered with pale hairs and slender plumose tails.

Clematis brevicaudata was sent to the Arnold Arboretum from the Museum d'Histoire Naturelle, in Paris, in 1886; in the same year seeds were sent to the Arboretum by Professor Brooks, of the Agricultural College at Sapparo, in Japan, which have produced the same plant, although this species does not appear to have been found before in Japan. It

has also come to the Arboretum from the Spath Nursery, at Berlin, under the name of *Clematis paniculata*.

It flowers regularly every year in the Arboretum, and usually ripens an abundant crop of fruit early in October.

Our illustration is made from a drawing taken by Mr. Faxon from one of the plants in the Arboretum.*

C. S. S.

Cultural Department.

Should Farmers raise their own Vegetable Seeds?

UNDER the above title, in the Report for 1889 of the Pennsylvania Experiment Station, is given the result of one year's observations upon this question. No subsequent report

practice is generally attended with the complaint that the varieties are not as good as they were originally. It is true that the fruits taken for seed are not carefully selected, and they are not gathered until the plants are past their prime condition. A careful seed-grower will, however, take the best fruits only, which practice tends to the improvement of varieties rather than their degeneration. Again, the farmer does not give the same careful cultivation to his vegetables, nor is he likely to have as rich a soil as the commercial seed-grower is certain to choose for that purpose. The subject seems worth some attention. The following is quoted from the first report:

"The question in its scientific aspect presents itself in the following form: Are seeds which have matured under high cultivation (as on our best seed-farms) better for our less enriched farm-soils than seeds which have matured in these poorer soils? The answer must be found in a comparison of



Fig. 22.—*Clematis brevicaudata*.—See page 138.

has been made, although the experiment has been carefully continued upon the same basis. It is a somewhat common practice among farmers to "save seeds" from the vegetable-garden of such plants as seed readily the first year, and the

* *Clematis brevicaudata* was described when it first flowered in America as *Clematis Picroi*, another Asiatic species, GARDEN AND FOREST, 1, 357.

results regarding earliness, productiveness, vigor and quality of the products. The conditions at the station are favorable to the work, and last year seeds were gathered from the best of those vegetables that seeded. The ground in which they grew is not a rich garden-soil, but only an ordinary farm-soil. These seeds were planted this year (1889) along with seeds of the same

varieties from the seed houses of Landreth, Dreer, Thorburn and others. In March the seeds were examined and careful weights taken of one hundred seeds of each variety. It appears from the tables that in nearly all the varieties of Tomatoes and Radishes mentioned the station-grown seeds were heavier than those from the seed houses, while those of the Lettuces in the majority of cases were lighter. Following this examination a test of the germinative values was made by putting one hundred seeds of each variety in the germinators. These results, given in the tables under the heading 'percent. sprouted,' are slightly in favor of the station seeds in case of Radishes, but against them in that of the Tomatoes."

The tables referred to contain all the observations made upon the plants during the growing season. It did not seem wise to draw conclusions from the records of one season, knowing how variable individuals are apt to be. The strongest indications of the tables were noted at that time as follows: "(1) The station seeds were, as a rule, heavier than the purchased seeds. (2) The weight was no indication of the germinative value of the seeds. (3) In the majority of cases the earlier marketable products were obtained from purchased seeds. (4) The greater yield, with but few exceptions, was obtained from purchased seeds. (5) Lettuce from purchased seeds produced heads that did not shoot up to flower as early as the plants from station seeds. (6) Radishes from purchased seeds were larger, more tender and more uniform than those from station seeds. (7) On the whole the results are strongly in favor of seeds from good soil, however rich that may be."

Some of these indications have been so strongly corroborated by subsequent investigations that we are tempted to name them conclusions. The germinative value of the seeds was generally higher with the station-grown seeds as tested in the germinators, but as many germinating seeds fail to vegetate in the soil, an experiment was made to test the relative values as to this point last year. It will suffice here to give the figures of the Tomatoes only, as they are emphatic on this point, and their behavior throughout is to be preferred in this discussion, since we must consider individual plants. The ultimate regard of the Radish is for the root, and of the Lettuce is for the head, while of the Tomato it is for the fruit, thereby implicating both root and stem in the production of the fruit. The following figures show that, with but two exceptions, the station seeds possessed the highest vegetative power. Seeds were sown in shallow boxes filled with good soil March 14th, and again March 25th of the following varieties of Tomatoes, using one hundred seeds of each variety, and noting carefully all that developed into good plantlets:

TOMATOES.	March 14th.		March 25th.	
	Landreth.	Station.	Landreth.	Station.
Acme.....	41	50
Golden Trophy.....	30	25	38	40
Livingston's Beauty.....	38	36
" Perfection.....	20	60	16	48
Mikado.....	45	80
Paragon.....	21	37
Trophy.....	25	21	20	50

These figures are, indeed, very much one-sided, but they concern a point of no serious moment to either the gardener or farmer. Seeds are cheap, and he can afford to sow three or four seeds to get one plant. Success in growing small plants from seeds depends largely upon the kind of care they receive. Thus would he dismiss the question. But what about the yield of marketable fruit? The third indication was strongly emphasized in the results of 1890 and 1891—namely, that "in the majority of cases the earlier marketable products were obtained from purchased seeds." The plants were all treated alike, in the hot-bed and in the field; yet, with but few exceptions, those from purchased seeds each year blossomed earlier by several days. In 1890 six out of seven parallels of as many varieties ripened earlier fruit by several days on plants from purchased seeds, and in 1891 five out of seven parallels indicate a similar result. Earliness is a matter of great moment to the market-gardener, because of the better prices obtained for first fruits.

A most peculiar coincidence lies in the fact that in almost every instance the heavier yield is associated with the later-appearing fruit, and is almost always with the plants from station-grown seeds. Thus:

Golden Trophy—Purchased seed, first ripe fruit July 30th; total yield of three plants up to time of frost, 11,143 grammes.

Golden Trophy—Station seeds, first fruit August 5th; total yield, 14,809 grammes.

Livingston's Perfection—Purchased seed, first fruit July 27th; total yield, 19,255 grammes.

Livingston's Perfection—Station seed, first fruit August 7th; total yield, 29,170 grammes.

In point of yield, therefore, the above figures (which are only representative cases from records) rather tend to favoring station-grown seeds, although the reverse seems to have been the indication for the first year. In a careful comparison of individual fruits it was found that the tomatoes from station seed attained a greater average weight and size and were generally possessed of thicker walls and more flesh throughout.

It should be added that the seeds used in every year of this experiment were taken from the original packages. Therefore the influence of climate upon the production of the seed is practically a fixed quantity, and the ages of the seeds remain relatively the same.

Thus far in the experiment two important conclusions seem to be strongly warranted by facts and figures regarding tomatoes:

1. Plants from purchased seeds yield earlier fruit than those from home-grown seeds.
2. Plants from home-grown seeds produce more abundantly than those from purchased seeds.

State College, Pa.

Geo. C. Butz.

The Greenhouse Under Trial.

WHEN arranging the greenhouse, the details of which were given in this journal (vol. v., p. 6), there was some doubt as to whether the two sections could be preserved in practical independence. It will be remembered that the design was to provide an intermediate house with a temperature of fifty degrees, and a cool section with a temperature of thirty-five to forty degrees, united under the same roof and partly open to each other. To provide comfortable quarters for a variety of plants is always a problem to the amateur whose taste takes anything like a free range. The greenhouse-plants are not especially difficult to arrange, for even in a small house one can usually find a suitable place for tender ones, but to arrange for those which must be wintered at a low temperature ranging to just above the frost-line is not so easily managed. The warm section has been rather improved by the change, being made more airy, while the temperature at night has been readily kept at from fifty to sixty degrees. When the north wall has been raised about three feet and steps have taken the place of the present north bench, I cannot at present see how any further arrangement could add available plant-room in the space. The annex has shown more vagaries of temperature, as this has been more influenced by outside weather, but during cold nights there is usually an extreme difference of twenty degrees in the two sections. The cool end of the annex is usually forty degrees and under, and the thermometer has often registered thirty-two degrees there.

This has been a good place to store Auriculas and other plants which should be kept nearly or quite dormant. As a matter of fact, this end was full of dormant plants, while within a dozen feet Cattleyas were brought into bloom; this, it will be remembered, with no partition between. The difference of elevation will, of course, account for a large portion of difference in temperature of the unheated section. As the door of the furnace-room is opened at night the end nearest this is the warmest, but this warmth does not make much impression on the solid bed. This bed is on the level of the garden, and the water from outside works up from below, keeping it cool, so that Carnations, Roses and Pansies planted out have made very little progress. Unless some arrangement was made for draining this bed thoroughly or for keeping the water out, it would probably become sour and unfit for use for planting out, and it would be better in any event to use it as a bed for plunging plants in pots. Pansies, Violets and Carnations, in pots, would be happy there. It has proved a capital cool bottom on which to stand pots of bulbs to come forward gradually, the flowers from these being much better and more lasting than if brought forward in more warmth. Some shelves near the sash furnish convenient places to arrange the pots when plants are in flower, or to store those which are averse to moisture. The bed being very wide the outer edge is used for the storage of Chrysanthemums which have come on slowly. At present a few Genistas, Azaleas and Easter Lilies, in pots, are slowly making ready to expand their flowers for the Easter-season. These latter, however, require rather more heat, and, after being well started, are properly brought forward in the warmer house.

While the expansion of the house has doubled its capacity and given the greater range of temperature, the necessary care has increased very little beyond the oversight of more plants. But as most of these were formerly relegated to a cold frame, the care has been actually less than before. The fire has been no more care, while the cool house during the winter requires very infrequent waterings. Of course, no one could devise a greenhouse which would be entirely satisfactory to another, and these details of some experiments are offered only as suggestions, which may possibly be helpful to persons with requirements somewhat similar to mine—i. e., a small house, with a wide range of temperature, which need not be a great care.

Elizabeth, N. J.

J. N. Gerard.

The Flower-garden.

IN the best gardens it is found that hardy perennials alone are not as satisfactory as when plants of other characters are judiciously mingled with the permanent occupants of the border. Many hardy plants flower early and die down at midsummer, and something must be provided to take their place, if for no other purpose than to cover the ground for the remainder of the season. The easiest way to do this is to sow, or plant, annuals in the vacant spaces, to fill up the gaps, and perhaps to render other services which we have not taken into account. On this side of the Atlantic we have as yet heard nothing of the dread disease that attacks Narcissus-bulbs, known as basal-rot. No doubt our drier summers, which prevent superfluous moisture around the bulbs during the resting period, enable them to enjoy a marked season of rest after the foliage begins to die down. To do this, European growers sometimes have to lift their stock of certain kinds to ensure thorough ripening and complete rest, and American cultivators sometimes ask if it is necessary to lift the bulbs annually, the impression that it is being probably derived from foreign periodicals and practice. It has never seemed to me essential to lift any bulbs except for purposes of division; and perhaps on retentive soils, which hold considerable moisture even in dry weather, the planting of annuals over them may have an excellent effect by appropriating this surplus water and such nutriment as the bulbs are unable to assimilate when at rest. Last year China Asters proved a complete success over the Narcissus-bulbs, the latter commencing to make new roots when the heavy fall rains came that put an end to the Asters.

The basal-rot is, unfortunately, only too common here among certain species of Lilies. When lifting a refractory kind we have too often seen it tumble apart, leaving but a few of the inner scales adhering to the root-stock. *Lilium excelsum*, *L. Brownii*, *L. Pyrenaicum* and the non-rhizomiferous Californian species are well-known instances, as too many of us can testify. This disintegration must not be confounded with the Lily disease proper, which is quite another thing. If planters would try these delicate Lilies among other plants, even among the dwarf shrubs, where they would have to fight more or less for an existence, the results would be far more satisfactory. I have seen *L. Pyrenaicum* (a most refractory kind) naturalized among rank grass, holding its own year after year and filling the air with its fragrance. Lilies are not exacting in their demands, and I think we usually err in kindness to them. We give them rich soil when decayed leaf-mold would be better, and we keep the soil about them religiously free from plants that would shade the surface of the soil, and keep it moist in hot weather, and absorb by root-action any superabundance of moisture when the bulbs are resting.

Besides strictly bulbous plants there are many herbaceous ones which die down early, such as the beautiful *Corydalis nobilis*, so rarely seen in gardens; *Mertensia Virginica*, the Oriental Poppies, all *Trilliums*, some of the *Dicentras* and *Ranunculus*. With a little forethought and less trouble, at least two distinct effects should be obtained in a border planted with hardy plants. The plants to use will readily occur to those who wish to try the plan;—Asters, Zinnias, Stocks, Mignonette, Candytuft, annual Poppies and Larkspurs, with such summer-flowering bulbs as *Gladiolus*, *Tigridias*, *Milla biflora*, *Tritomas* and *Montbretias*, these latter being lifted and stored in the cellar in fall.

South Lancaster, Mass.

E. O. Orpel.

Petunia Blight.—In a large commercial propagating-house it was lately observed that many of the *Petunias* in small pots looked yellow and unhealthy. A microscopic examination of the diseased leaves proved that they were infested with a genuine leaf-spot fungus (*Ascochyta Petuniæ*). Frequently the leaf is attacked near its centre and the fungus spreads rapidly

in all directions, often in such a way as to exhibit a number of well-defined rings in the infested area. The spores are produced in vast numbers in spherical bodies, each with a small opening at the middle of the exposed side, and from which the spores stream in a serpent-like coil when a dry leaf is placed in water. Examination of other dead leaves showed a second fungus, differing in several respects from the *Ascochyta*, but in nothing more than in the spores. These, instead of being of the shape of a figure 8, are long and slender, often somewhat curved. This offender is a *Septoria*, which seems to be new, and it is likely to wear the name of *S. Petuniæ*. Both of these fungal enemies were doubtless in the stock plants from which the cuttings were taken, and a large part of the difficulty would be obviated by using healthy mother plants. From the nature of the troubles it is evident that the diseases could be held in check by the standard fungicides if taken in time.

Rutgers College.

Byron D. Halsted.

Success with Lilies.—The largest and finest bulbs of *Lilium superbum* I ever found were growing in a reclaimed swamp which had been drained to a moderate depth and planted to Cranberries. The Cranberries failed, and wild grasses and bog-plants were allowed to take their places. The Lilies originally grew in the muck, of which there was a good depth, and this had been covered with about three inches of sand, making in all about six inches of covering, and they were thickly shaded by a rank growth of grass. The largest single bulb of this Lily I ever found was growing by the road-side, where the wash of the road had covered it deeply with coarse sand. This bulb had an immense system of strong roots, and both bulb and roots had that clean white appearance which indicates a rapid and healthy growth. To all appearance this plant had nothing but wet sand to sustain it, but no doubt the washings of the road furnished it with liquid-manure in just that dilute form which best suited it. The best-cultivated Lilies are grown under similar conditions. If a deep furrow is run through well-drained sandy land, and swamp-muck is liberally placed in the bottom, with a light covering of sand, the bulbs can be set on this and the furrow filled in. With a liberal mulch of sphagnum over this the Lilies can hardly fail.

Hammon, N. J.

W. F. B.

Correspondence.

Spring's Onset.

To the Editor of GARDEN AND FOREST :

Sir,—Those who watch the outdoor world observed a strange event this year in the sudden arrival of spring. Commonly we are used to some faint and broken preludings of the real season—advances, arrests, retreats. This year there were none of these. The winter has been nearly normal, and showed no fantastic outbreaks of vegetation due to unwontedly mild weather. The Japan Quinces, indeed, threw out here and there a blossom in midwinter, but we are used to these sportive reminders—signs of nothing but a hardy, happy habit. The Willows, before the new year, had wrapped themselves in aureoles of deeper tint than their accustomed winter adorning, but they kept their dull gold unchanged. Such, at least, was our observation on the island of Manhattan, and especially in its noble pleasure-ground, the Central Park, "which," the London *Spectator* has just said, "in another generation will be the most beautiful public resort in the world," the *Spectator* not knowing nor dreaming of the possibility that anybody should plot to convert it into a trotting-course.

On one day the park lay in still winter guise, the guise of February certainly, and not of December—for there is a difference—but distinctly of winter, silent, in a monotony of color. The next morning spring had come, the monotony was broken, the land and all its children stirred and stretched with awakening strength. The "furtive look" had come, the mark of "a purple finger on the slope," the feeling of "a flower expected everywhere," to use Emily Dickinson's phrase. Stems of shrubs were dyed suddenly with brilliant carmine or vivid green. Masses that only the day before had been dull brown across their tops were now suffused with pale pure yellow, difficult to fix as the end of a rainbow, vanishing under close inspection, but from a distance positive and distinct. So had a glow come into the gold of Willows, and the massed tree-tops seen across open spaces and against the sky, soft, deep rose-purple in place of sepia. All this, and much more, actually overnight, if close observation day by day may be trusted. And though such changes are subtle they are unmistakable, and essentially greater than many of larger physical proportions, for they are of character.

Every season we are apt to esteem peculiar, in spite of inexorable records that show general and particular likeness, and it may be unwise to insist too strongly upon the absolute novelty of sudden change such as is here recounted, but in the memory and records of one observer it stands alone. Whenever this change does come, and whether gradually or suddenly, it is one of the most affecting beauties of all the year. The mist of tender color is more enchanting than the gorgeous beauty of which it is the prophecy. And it is not only in itself beautiful, but a marvel and a mystery—a mere hovering haze that flies before one and evades approach; ghost-like, as though it were the spiritual part of flowers first arrived, and waiting uneasily for bodies yet to be.

New York.

J. E. Learned.

A Freak of a New England Orchid.

To the Editor of GARDEN AND FOREST:

Sir,—It was on the first day of August, in the course of an idle tramp of an hour or so, in the midst of a shady mosquito-haunted bog, where the smaller purple-fringed Orchids were blooming in abundance, that I was almost electrified by the sight of a stately spike of brilliantly white flowers just before me. With the eagerness of an amateur botanist I gathered this solitary specimen, jumping at the conclusion, as usual in such cases, that it was certainly something never before reported in this locality. On examination, it bore a rather humiliating resemblance to the *Habenaria psychodes*, in whose company it was found; but the height—two feet nine inches—and length and diameter of the spike far exceeded those of any of its humble relatives. It was a magnificent specimen, in perfect flower, and the petals and sepals were certainly larger than those of any of the orthodox *H. psychodes*. Then, too, the lip was in a horizontal position, at right angles with the erect upper petals. With these exceptions, the flower was identical, even in odor. It is to be remembered, of course, that it was pure white.

The question is, What was it? If the fringing of the lip had only been capillary and the spike a little looser, it would have passed for *H. leucophæa*, as described in Gray's Manual. I am told by good authorities that the fact that it was white counts for nothing, and the fact that it was growing in company with *H. psychodes* is presumptive evidence that it was simply an albino of that species. Other good authorities say that, while this is the natural supposition, it is possible that it is a hybrid—perhaps of *H. lacera* and *H. psychodes*. I have seen white *Pogonias*, heard of white *Cypripediums* (acaule), but never heard of a white *Habenaria psychodes*. Of course, they are found in deeper and lighter shades of purple, but has anybody ever found one pure white?

Norwich, Conn.

J. T.

Periodical Literature.

In a paper recently read before the Torrey Botanical Club, in this city, and reprinted in the *Bulletin* of the club for March, Professor Byron D. Halsted says that during the past two years a large number of variegated plants have been examined with reference to the presence of parasitic fungi, attention having first been called to the subject "by a study of the foliage of a variegated Ash, which had its leaves badly spotted with a species of *Coniothyrium*, while ordinary Ash-trees were free from the same fungus." He gives an alphabetical list of fifty genera, including more than a hundred species of variegated plants, both hardy and grown under glass, which had been found specially subject to the attacks of fungi. The author says that it is not his purpose to enter into the causes of etiolation or variegation, or to draw well-defined conclusions from the facts which he presents. But he adds that the ordinary green forms of many species have also been studied, with the result of showing that they are much less frequently attacked than the variegated sorts. Furthermore, in some plants the etiolated part occupies large portions of the leaf, and, as a rule, the portions without the chlorophyll are the most susceptible. In the *Aspidistra*, for example, the one-half of the long leaf may be green and the other white, in which case the latter is with few exceptions the only one attacked. In the *Hydrangea* the middle of the leaf is etiolated, and here the blight first begins its destructive work. In other plants, where the white is distributed in blotches near the margin of the leaf, the decay due to the fungus produces a ragged edge. And when the variegation is quite evenly distributed over the leaf the parasite is widely scattered and the whole leaf decays, as in *Dieffenbachia* and *Abutilon*. The author concludes: "There seems to be no question that the variegated leaves are more suscep-

tible to parasitic fungi, and that likewise the etiolated parts are the ones first attacked. The absence of green in a leaf is a source of weakness. Speaking generally, a variegated plant lacks capacity for the best work, and the gardener, in propagating a variegation, no matter how it may have originated, is propagating a weakened plant in so far as it has had its normal amount of chlorophyll reduced. It is a pity that so many of our choicest variegated plants blight easily; it is, however, natural that they should do so. Even a fungus parasite will take the line of least resistance."

We may add to this interesting communication that it does not seem a great pity that variegated-leaved plants should have characteristics which may gradually discourage that love for them which is so marked among amateur horticulturists, and, unfortunately, among some landscape-gardeners as well. Except as curiosities to be preserved in a greenhouse or used in the decoration of a room, variegated forms are seldom as attractive as the more normal forms from which they have originated, or, we may truthfully say, deteriorated; and their excessive use out-of-doors is one of the evils against which true lovers of landscape beauty have to protest. In formal gardening arrangements a discreet taste can employ them with good effect; but in the naturalistic arrangements, which are much more common in the present day, very discreet, indeed, must be the taste which can use them without injury to the repose, harmony, unity and simplicity that should characterize a landscape. In most European countries they are still more profusely employed than here; but even here we too often see lawns and plantations disfigured with many crude spots of variegated color where the eye would be far better pleased by the gentler variety which different shades of green can give.

Recent Publications.

The Formal Garden in England. By Reginald Blomfield and F. Inigo Thomas. London: Macmillan & Co., 1892.

There has long been great need of a good book in the English language on formal gardening. The one which Mr. Blomfield has recently written, and which Mr. Thomas has illustrated, is interesting, and in certain respects is instructive; but it will not adequately fill the empty place on our shelves. It will do little to convince narrow devotees of the "natural style" of gardening that the formal style has its merits also, and still less to explain to those who already believe this fact under what conditions each style is appropriate, or even what is the essential difference between them. This is because its author has written not in an impartial spirit, or even as a fair-minded advocate. He stoutly denies that there is or ever has been such an art as landscape-gardening, and implies that in the nature of things there can be no such art. Formal gardens, he says, are designed; grounds treated in other ways are not designed, and only make a pretense of being designed. He condemns the narrowness of landscape-gardeners, and proves himself narrower than any of them. He carefully notes their follies in act and word, but as carefully abstains from any mention of their worthy work or even of the problems which afford them their best opportunities. He perpetually goes out of his way to assert that landscape-gardeners have ruined whatever they have touched, but he never explains how their larger undertakings might be better managed. The only passage in his book which even grudgingly admits that the landscape-gardener as well as the designer of formal gardens has his place in the world, is the one where, after saying that formal gardens do not need to be very large, he adds, "If either style wants room, it is the landscape, for unrestricted space is of the essence of natural scenery; and, indeed, the only places where its use appears tolerable are gardens such as those of Chatsworth, where the grounds are so large that there is a real suggestion of scenery *sui generis*, as of a wood in which clearings have been made and the grass kept carefully trimmed." In short, Mr. Blomfield's preferences are so narrow, his temper toward everybody and everything unapproved by these preferences so bitter, his arguments so one-sided, and his descriptions of the aims and ideas of the landscape-gardener so disingenuous, that his book is likely to do more harm than good to the cause which he has so warmly at heart. He could have pleaded the cause of formal gardening design much more effectively had he shown us first where and how landscape-gardening can produce good results and then where and how it cannot, instead of assuming that it has never produced a really good result, and in the nature of things never can.

The historical passages of his book are interesting when one can ignore the writer's underlying mood. They give in a compact shape a great deal of information hitherto scattered

through books which are inaccessible to the general reader. The illustrations add greatly to the value of the text, although they do not always prove its assertions. They seem to show that English gardens, before French influence had extended them into parks and planted them with dense groves and mighty avenues of long extent, must have been pretty spots to look at, excellent spots in which to grow pretty flowers, and good accompaniments for architectural effect to the houses which face upon them; but that the excellence in design, of which we read so much, was of a very rudimentary and naïve sort except as regarded absolutely architectural features. Terraces and walls appear to have been well imagined and constructed, but nothing that can be called an architectural treatment of trees and of large areas of water and grass appears to have been attempted until the advent of French fashions. The garden areas themselves were small, and their design consisted simply in the perpetual repetition of the simplest geometrical figures. They were undoubtedly good gardens, and gardens of the sort which were most appropriate to houses of the usual English kinds. But they were not great works of art like the gardens of Le Nôtre and his immediate followers. Mr. Blomfield's chapters are a little confused in arrangement, and it is not always easy to put the right date upon the things which he describes; but the general impression left by his book is that the advent of French influence first developed garden design in England into an important art. Best of all are the chapters which discuss in succession the different features of old gardens, and here we often come upon very good bits of advice. For example, the author wisely counsels the use of stone or leaden statues and ornaments instead of white marble ones, which are too glaring for the English climate, and bronze ones, which are too sumptuous in effect except amid very splendid surroundings. He is right, too, when he says that clipped shrubs and trees are not more unnatural than many other things which we admit into our natural gardens, although he exaggerates in saying that they are as natural as clipped grass. The ordinary processes of husbandry and pasturage have accustomed our eyes to surfaces where the grass is cropped short, but not to trees cut into stiffly symmetrical forms. Such trees may have their place in art, however, and we only wish that Mr. Blomfield had defined this place more intelligently for the instruction of those who deny that it exists. We wish also that, while protesting against that degeneracy in topiary work which followed the introduction of Dutch gardening fashions, he had not himself chosen to admire one very Dutch example of which he gives an illustration. Trees and shrubs may be clipped upon occasion, but never into the likeness of a wall upon which are perched two colossal doves. Nor will all the architectural and sculptural features of old gardens which the illustrations reproduce ever gratify a taste that cares for purity in outlines and for vigor combined with delicacy in the treatment of details.

In speaking of grass-theatres Mr. Blomfield cites no existing example, but says that "in the gardens of the Prince Bishops, of Wurzburg, there was a famous amphitheatre formed of banks of turf with clipped hedges for scenery." He may be interested to learn that in the Grosse Garten, at Dresden, once a royal but now a public park, such a theatre still exists in good preservation. It lies between two of the main avenues, hidden from sight by thick masses of trees, and is approached by a narrow path. This path cuts it through the centre, the ranges of turf-seats rising on one hand and the turfed stage on the other, surrounded by masses of foliage, which were probably once more closely trimmed than they are to-day, and ornamented with moss-grown statues of gray stone—Rococo works, which are pretty bad from the sculptural, but very effective from the decorative point of view.

Chemicals and Clover. This is a little pamphlet by H. W. Collingwood, one of the editors of the *Rural New Yorker*, and the part of it which has real value is that which records the success of certain New Jersey farmers who practice the following four-year rotation of crops: Potatoes are planted on ground where Corn has been grown the year before, with a thousand pounds of some so-called complete fertilizer to the acre sown broadcast before planting and five hundred or more pounds later in the drill. In the fall the Potato-ground is plowed and seeded with Wheat and Timothy, and Clover is sown in the spring. The next year the hay is gathered, and in the third year of the rotation, after the hay is cut, all the stable-manure made on the farm is hauled out and spread on the sod, and the aftermath is allowed to decay on the ground. Next spring the land is plowed and the ground planted to Corn, which finds abundant nourishment in the decaying sod. The principle of this sys-

tem is that the heavy dressing of chemicals on the Potatoes not only yields a profitable crop, but leaves the soil sufficiently fertile to give a crop of Wheat and Grass. The stable-manure helps to make a heavy sod, and the Corn is able to appropriate the coarser part of the food by its strong digestion. As little stock is kept as possible outside of the working teams, and no particular pains is taken to increase the amount of stable-manure. We apprehend, however, that there is little danger of having too much of this on the sod; and the stable-manure does not deserve the depreciating tone in which it is alluded to.

It is quite true that in many cases it is cheaper to purchase and apply a given amount of nitrogen, phosphoric acid and potash in commercial fertilizers than it is in stable-manure, and in some cases the same amount of these in chemical fertilizers will show quite as good results as it would in well-rotted stable-manure. In other cases in our own experience plant-food in chemicals has not been relished by crops as well as the same food in well-decayed and well-fined stable-manure. It may be that, apart from the plant-food in stable-manure, it furnishes a nidus wherein are multiplied those microscopic organisms which science has found to play so important a part in the growth of plants. Some old market-gardeners on Long Island will not haul stable-manure from the station to the farm if it were given to them. They say it is cheaper to buy chemicals and to apply them alone than it is to transport and apply the bulkier material. But, then, in these old gardens tons of manure have been used on every acre annually for a generation, until the ground is filled with carbonaceous matter left by old applications from the stable, so that the nitric ferment and other bacteria which are helpful to plant growth may already occupy the ground in sufficient numbers. This, however, is only a surmise, but the fact remains that our knowledge of the processes by which plants avail themselves of the materials for their development which are found in air and water is very limited. There is no doubt that so-called artificial fertilizers are destined to a wider use in the future as we learn how to use them to better advantage, and the accurate records of any experiments with them are always worth preserving.

Notes.

In Mr. Blomfield's *Formal Gardening in England* he tells us that during the War of Independence many of the leaden figures which ornamented old English gardens were exported to this country, nominally as works of art, but really to be melted down and cast into bullets.

In Ellwanger & Barry's general catalogue, in addition to the classified list of Roses, where the different families are separated with unusual care, there is a valuable alphabetical list including about 350 of the leading sorts in cultivation, in which the class to which each individual belongs is indicated by abbreviations.

Last week Mr. Gerard sent to this office flowers of *Iris Bakeriana* and of *I. histrioides* which had been snowed under twice. In spite of the severe weather, they looked perfectly fresh and bright, and exhaled a distinct Violet odor. These early Irises are among the most attractive of the flowers which brave the frosts of March.

A Philadelphia correspondent of the *American Florist* says that Mr. C. D. Ball has remarkable success with *Lilium longiflorum*, which he grows in quantity for Easter decoration instead of *L. Harrisii*. The flower of the former has more body, so that it will endure longer, especially if it is warm, as it often is at Easter-time, while the erect habit of the flowers makes them easier to ship. Most persons consider it more graceful than the Bermuda Lily.

So careful are the Japanese in their study of what is appropriate and inappropriate in the arrangement of flowers, that they would not use even a small metal stem-fastener without considering the character of its design. A fastener in the shape of a frog, for instance, may be used with both land and water plants, but one in the shape of a hare, especially suitable for use with wild plants and grasses, would never be affixed to water plants, and one in the shape of a pair of carps is reserved for water plants alone.

The exhibition of the Pennsylvania Horticultural Society next week promises to be one of exceptional interest. The large private collections in Philadelphia and its neighborhood are always represented by choice plants, and the local commercial growers have an enterprise and public spirit which is seen at its best at these exhibitions. Mr. Blanc will make such a

display of Cacti as can be seen nowhere else in this country, and a feature of great interest will be a contest for the premium offered for Mushrooms.

The last bulletin from the South Dakota Agricultural College Station relates to the growing of the Sugar Beet, and it is stated that with proper cultivation these Beets, with a high percentage of sugar, a good purity co-efficient, a large yield per acre, and in every way adapted for the manufacture of sugar, can be grown throughout the greater portion of that state. A report from the Experiment Station of Wyoming also adds that the dry cool autumn of the arid region there tends to store sugar in the beets, which will grow well where a slight summer irrigation can be given to the crop in a mellow soil.

A new Violet, burdened with the name of Frau Hof Garten-direktor Jülke, and said to be a cross between Lee's Queen Victoria Violet and *V. Rossica superba*, was introduced a year ago by a German florist. The *Gardeners' Chronicle* quotes some Continental authority who pronounces this the pearl of all existing varieties. It is not furnished with runners, and the leaves are of a glittering green color, which is a particular merit. The flower-stalk is long, the flowers larger than those of the Russian, the color light blue, the fragrance powerful, and in floriferousness it exceeds all other known Violets. Placed in the greenhouse or in a cold frame in the autumn, it continues to bloom, and if at the end of the month of December or beginning of the new year it can have the warmth of an intermediate house, its season of flowering will be extended into the spring. The cultivation of the plant is identical with that commonly pursued with Violets.

The notorious Italian slum in this city, which is called Mulberry Bend, will be torn down shortly, and the space it covers will form part of a new park, consisting of an irregular plot bounded by Park, Mulberry, Bayard and Baxter streets. Baxter Bend, an equally ill-favored quarter, will also disappear, and the new park will touch the corner of that little triangular breathing-space which was established when the Five Points district was partially redeemed some years ago, and which surely bears the most oddly optimistic name of any such spot in the world—Paradise Park. The price which the city will have to pay for the new park will be very large, for land upon which so many human beings are crowded commands at least ten dollars a square foot, and often more than twice that amount; but no money will be wasted if it insures another playground for the very poor, and at the same time the destruction of the vilest rookeries which disgrace New York. And yet, with a strange inconsistency, while New York is spending a million and a half of money to make room for a little turf and a few trees here, some of her leading citizens are beseeching the Legislature for the privilege of covering up Bryant Park with a huge municipal building, others are trying to confiscate City Hall Park for the same purpose, and others still are endeavoring to destroy Central Park itself in the alleged interest of the American trotter.

At the last convention of the American Forestry Association Mr. Gifford Pinchot read a paper on the history of forest-policy, from which we quote the following: "The spirit of the recent Swiss forest-legislation is one which must permeate our own coming forest-laws if they are to win that acceptance with the people without which they must be worse than useless. It has been summarized as follows by Professor Landolt: 'Our forest-laws are intended to work more through instruction, good example and encouragement than by severe regulations. This method is somewhat slower than one which should involve more drastic measures, but the results achieved are more useful and lasting. When forest-proprietors do something because they are convinced of its utility, it is done well and with an eye to the future; but what they do under compulsion is done carelessly and neglected at the first opportunity. What they have come to learn in this way, and have recognized as good, will be carried out, and that better and better from year to year.' This homely statement of the great Swiss forester is full of the wise moderation of a man conscious of the dignity of his work. Successful forest-reform, here as there, must be a growth from the education of the people, finding its expression in laws which respect both the needs of the forest and the needs of the people, and which waste no time in mistakes. Such legislation is respected, because it is capable of being enforced. The results of it are so large, it is so surely a part of the future, that the friends of forestry in America ought to work for it with the steady vigor of men who know they are going to win."

An account of that district of southern France which is called the Camargue, recently published in the *Revue Indus-*

trielle, shows how extensive and how successful are the works of irrigation undertaken by the French Government. This district occupies the triangular space formed by the two branches of the Rhone in their course between the point of forking and the Mediterranean, and although in mediæval years it contained important seaport-towns, for generations it has been a malarious waste, where the ancient cities presented astonishing pictures of death and decay, and where the boundless fields were given over to wandering herds of half-savage cattle. The district being really an island, composed entirely of alluvium brought down by the river, it was often partly overflowed; so the first need was to build dykes to protect it. Then ditches were dug and pumps set up for the removal of the water which soaked into the soil beneath the dykes, and this water was thrown into a great basin called the étang Valcarès, which was furnished with an outlet to the sea. Then, as the land would thus have been rendered too dry, irrigating canals and pumps were established to bring in water from the Rhone at the upper part of the territory, and as by this means certain portions could also be flooded if desired for the destruction of the phylloxera, large plantations of the Vine were made. The climate is excellent for grape-cultivation; pasturage also became profitable, and certain new plants, among them the Australian "Salt-bush," have been introduced with a prospect of commercial success. Thus, according to the *Revue*, a desert region dangerous to health has been transformed into a fertile stretch of country which is rapidly growing more and more populous, and a network of railways has been begun to develop its resources to the full.

In the last number of *Agricultural Science* there is an account of a new edible Blackberry, by Professor Bailey, which, in honor of Dr. C. F. Millspaugh, who collected it at an altitude of 3,500 feet in West Virginia something more than a year ago, is called *Rubus Millspaughii*. It is a bush Blackberry with long wand-like canes and destitute of thorns. Dr. Britton, who named it, knew of no other specimens than those of Millspaugh except a single leaf of it in Linnæus' Herbarium, in London, collected by Kalm more than a century ago. Professor Bailey thinks, however, that it is generally distributed over the northern and eastern states, since he has had good specimens of it from the Big Smoky Mountains, in North Carolina, at 6,000 feet altitude, and he knows of other specimens from the White Mountains, and the Keweenaw Peninsula, Lake Superior, so that it would appear that the species grows upon our northern borders and follows the mountains southward, which accounts for the fact that Kalm found the specimen in Canada. This Blackberry has some importance to horticulturists on account of its thornless canes. The so-called thornless Blackberries of gardens are nothing but comparatively unarmed forms of *Rubus villosus*. The fruit of this plant is said to be good. Mr. Kofoid, who collected it in North Carolina, writes that as late as August 29th the fruit was just ripening to a faint reddish tinge, and was quite palatable even then. The natives say that the fruit ripens in September. The berries are large, long, slender and sweet, lacking the acid and bitterish quality of berries on the lower mountains. Besides the absence of thorns, which distinguishes this species from *Rubus villosus*, it lacks the pubescent character of the common species, the leaves are thin, the leaflets sharply toothed and prominent; on vigorous shoots the leaflets are five, and the three upper ones have stalks from one to two inches long.

Catalogues Received.

THE DE LAVAL SEPARATOR CO., 74 Cortlandt Street, New York; Cream Separators.—M. V. DICKENS, Trumansburg, N. Y.; Fruit and Ornamental Trees, Grape Vines, Small Fruits, Shrubs, Roses, etc.—T. J. DWYER, Cornwall, N. Y.; Choice Small Fruits, Trees, Shrubs and Vines.—ELLWANGER & BARRY, Rochester, N. Y.; Small Fruits and Fruit Trees, Ornamental Trees, Shrubs, Pæonies, Hardy Border Plants, Roses, etc.—HILFINGER BROS., Fort Edward, N. Y.; Trade Price-list of Standard Flower Pots, Vases, Seed Pans, and Cylinders for Cut Flowers.—HARLAN P. KELSEY, Linville, N. C.; Special Spring Offers and Wholesale Catalogue of Native Trees, Flowering Shrubs and Herbaceous Perennial Plants.—JACOB W. MANNING, Reading, Mass.; Descriptive Illustrated Catalogues of Some Recently Introduced Trees, Shrubs, Vines and Hardy Herbaceous Perennials; Large and Small Fruits; Ornamental Trees, Shrubs and Climbing Vines; Choice Hardy Perennials.—PITCHER & MANDA, Short Hills, N. J.; Special Importation of Orchids.—O. M. RICHARDSON, Canton, Oxford Co., Me.; Northern-grown Flower and Vegetable Seeds.—TEXAS PECAN AND SEED CO., Fort Worth, Texas; Pecan Nuts for Seed.—DAVID G. YATES & Co., Germantown Ave., Philadelphia, Pa.; Evergreens, Ornamental and Fruit Trees, Shrubs, Roses, Greenhouse and Bedding Plants.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLES:—The Speedroad in Central Park.....	145
A Modern Massachusetts Farm. (With plan.).....	145
The Great Madrona of San Rafael. (With figure.).....	146
Color in Rural Buildings.....Mrs. Schuyler Van Rensselaer.	146
NEW OR LITTLE-KNOWN PLANTS:—New Orchids.....R. A. Rolfe.	148
FOREIGN CORRESPONDENCE:—London Letter.....W. Watson.	148
CULTURAL DEPARTMENT:—Flower Garden Notes.....E. O. Orpet.	150
The Cultivation of Bulbs in the South.....Professor W. F. Massey.	152
Early Irises.....J. N. G.	152
Notes on Begonias.....T. D. Hayfield.	152
Arachnanthe Cathcartii.....John Weathers.	153
Chrysanthemum Blight.....S. A. Beach.	153
Manettia bicolor,*Acacia Drummondii.....T. D. H.	153
CORRESPONDENCE:—Grafting.—I.....A. W. Pearson.	154
Myosotis palustris.....Charles L. Mann.	154
Baccharis halimifolia in Atlantic County, New Jersey...Rev. John E. Peters.	154
EXHIBITIONS:—The Boston Flower Show.....	155
PERIODICAL LITERATURE.....	155
NOTES.....	155
ILLUSTRATIONS:—Plan of the Phillips Estate, Beverly, Mass.....	149
The Great Madrona of San Rafael, Fig. 23.....	151

The Speedroad in Central Park.

IF the construction of a road for fast driving in Central Park was a matter of local importance merely, we should not feel called upon to make any further allusion to the subject. But the case is a representative one. All our rapidly growing cities feel just as New York does this pressure for more room. Land set apart for pleasure-grounds in these cities is constantly coveted by individuals and classes who wish to devote it to some special use which seems to them of pressing importance. Central Park was the first area of anything like a square mile in extent ever designed as a consistent work of landscape-art in the heart of a great city for purely rural recreation and the refreshing influence of pastoral scenery. If, after thirty years of experience, the leading city of the country should declare by its example that such a park could not be maintained for such a use, it would be a discouraging blow to all who take any practical interest in public pleasure-grounds in other cities. It would incite attacks on every other park and make all park-property in the country more insecure.

There is no need of restating the arguments against this project. Four years ago, when the last formidable movement for securing the so-called speedroad was in progress, the salient objections to it were set forth in this journal (Vol. 1., p. 37), and as late as our issue for March 9th the subject was discussed in a leading article. It may be well, however, to make a brief statement of what has recently taken place. Less than a fortnight ago the House of Assembly passed an act which had previously passed the Senate authorizing the construction of a road in the park for fast driving. The Governor signed it the same afternoon and the Mayor of this city gave a statement to the morning papers in approval of the measure. The Park Board at a special meeting the next day ordered their engineer to prepare plans for the road and voted funds to defray the expenses of the survey. Nearly every newspaper in the city

at once attacked the scheme and a volunteer committee of citizens was formed to invite petitions of remonstrance and secure funds for holding a public meeting. The demonstration was so prompt and energetic that the Mayor discovered a "difference of opinion" in the matter, and at his request the Park Board announced that it would give a public hearing on the question. The protestants appeared in force and the Park Board rescinded its action; and after the hearing had been continued another day, the Board voted that it was inexpedient to build the road. All this happened within a week. Meanwhile, names by the thousand and money enough to meet all expenses poured into the rooms of the Citizens' Committee. The newspapers kept up the attack with singular unanimity and vigor, and last Friday a memorable meeting to demand the repeal of the act was held in the hall of the Cooper Union. A committee of one hundred was then selected to lay the case before the legislature, and it is possible, though hardly probable, that the act will be repealed before this paper reaches its readers.

In large cities individuals are apt to feel indifferent about matters of this sort, so that the spontaneous uprising of the people was almost a surprise. Particularly gratifying was the action of the workmen, whose organizations lent most efficient aid to the defenders of the park. One of the most telling speeches at the meeting was made by Mr. Archibald, representing the Central Labor Union, who showed that the park had an especial value for the families of those who could not get away to the mountains and seaside for the summer. The sound views on the true functions of an urban park expressed by all the speakers at this mass meeting showed that the people are prepared to take high ground as to the value of such parks, and this is a renewed assurance of their safety. Ex-Mayor Hewitt was especially happy in demonstrating that a park is a great educational and moral as well as a sanitary influence in city life. A letter from Mr. Frederick Law Olmsted argued that since the earnings of the people of the city had been put into the park for a particular object it would be unjust and immoral to divert it to a use inconsistent with that object. The construction of the speed-track would, therefore, lessen the security of every man in the enjoyment of his earnings and tend directly to anarchy.

Altogether there is good reason to believe that the park is in less danger of any destructive invasion than it was before this attack. The people have had an opportunity to give expression to their affection for the park and to prove their power in protecting it. They have been called to think over their moral obligations in the matter, and the public-spirited men of the city, the men on whom its future prosperity depends, will give their influence to the side of stability and security when such questions arise, and will not permit the city to degenerate into a condition where nothing is sacred and nothing is safe.

A Modern Massachusetts Farm.

THE plan of an estate in North Beverly, Massachusetts, published on page 151, deserves the careful attention of all persons interested in rural economy because it stands for what we hold as the fundamental principle underlying all successful agriculture—the adaptation of the crop to the character of the soil. This principle is well understood now in most European countries, but the neglect of it in this has caused the unprofitable removal of millions of acres of valuable forests from lands suited by nature to produce forests, but entirely unfit for permanent and profitable tillage.

The estate which stretches along the western shore of Lake Wenham, a beautiful sheet of fresh water, consists of 275 acres, and was bought in 1879 by the late John C. Phillips, of Boston. The purchase comprised a number of farms or parts of farms and various small parcels of land; only a part of it, perhaps forty acres in all, being adapted

to tillage. A hundred acres of upland and swamp were covered with a natural growth of hard wood, Pines and Soft Maples, the remainder of the estate being overlaid by dry glacial drift, clothed with scanty herbage and occasional clumps of stunted Blackberry-bushes. Early attempts at cultivating this land had exhausted whatever fertility it had ever possessed, and the free range of cattle over it for generations had prevented trees from springing up to cover its naked surface and replace the forests of Pine which should never have been cleared from it.

The dwelling-house was placed by Mr. Olmsted, who was asked to prepare a scheme for laying out the estate, on a rough stone terrace built to receive it on the steep bank of the lake, and the drives as they appear on the plan were constructed under his directions. The beauty of the situation and the charm of the native woods on the sides of the old moraine in the north-eastern part of the estate had been the prime motives which induced Mr. Phillips to choose this particular site for his country home, but this once determined on it became necessary to develop some scheme for the economical treatment of the large area of poor land which could not be tilled except with large annual expenditures of money, and which could never be made into satisfactory and productive farming-land. It was evident that if the agricultural efforts of the owner could be confined to the good land that better results could be obtained than could possibly follow any effort to convert a larger part of the estate into a farm, and under Mr. Olmsted's advice this view was adopted. A tract of low, wet, rich soil, about forty acres in extent, in the north-west corner of the estate, and just north of the barns as they are now located, was thoroughly drained and made one of the best and most productive fields in Massachusetts. It remained to determine the destination of such portions of the remainder of the estate as were not already covered with trees. It was soon apparent that there was but one course to follow, and that was to cover it as rapidly as possible with such varieties of trees as grow naturally on poor soil, and so avoid the expense of annual tillage or the annual harvesting of unprofitable crops of scanty grass.

Mr. Olmsted's idea was to convert the whole estate, with the exception of the arable land in the north-west, into a more or less open forest, in the midst of which the manor-house should stand like a forest-lodge in an oasis of kept grounds confined to its immediate neighborhood and encircled by the boundaries of the terrace; and although this plan has not yet been entirely carried out, all the operations of late years have been made with the idea of gradually extending the plantations over the whole of the dry uplands. The first plantation was made in 1880, and the area now planted is about seventy-five acres. A number of varieties of trees were tried, principally European Larch, the Scotch Pine, the Austrian Pine, the Norway Spruce, the White Pine, the Douglas Fir and the Canoe Birch, but of late years White Pines have been used almost exclusively, about sixty thousand having been planted since 1883. The Larch has grown very rapidly, making trunks a foot in diameter in twelve years, and are as thrifty and as promising of long life on the shores of Lake Wenham as the Larch on Mr. Henry G. Russell's estate, described last year by one of our correspondents; they are not as tall, however, as the Canoe Birches, which have grown on this soil with remarkable vigor, indicating the value of this tree, one of the best timber-trees of our northern forests to plant on light gravelly soil. The Douglas Spruce has grown rapidly, too, and vigorously, and there is every indication that it will reach a large size on this soil. The Colorado variety of this noble tree, which is certainly one of the most promising of all exotic conifers introduced into the north Atlantic states, can be seen in greater numbers on the Phillips estate than anywhere else, different individuals displaying a remarkable diversity of habit and a great variety of shades of color. White Pines increase in height from one to four feet every year; and the appearance of the young plantations indicates that, for covering the

sterile hills of New England in spite of insects which attack and often deface it, this is the safest and the most profitable tree to plant.

We feel that an estate like this, managed intelligently on a system conceived and developed with the view to the best permanent economic results is an object-lesson of real public importance; any well-planned and prudently conducted experiment which directs public attention to the possibility and advantage of using lands not otherwise valuable in a way to secure a fair profit to their owner helps to establish and enlarge the prosperity of the state.

Here in America carefully prepared schemes for the improvement of country estates generally die with the person who makes them, and his efforts and expenditures are too often lost, but a better fate has attended the Phillips Place, which fortunately has passed into sympathetic hands, and is administered with intelligence, energy and steadiness of purpose, and with the determination to develop and perfect the well-considered plans of its original owner.

The Great Madroña of San Rafael.

SOME months ago there appeared in this journal (vol. iii., p. 509) an account of the California Madroña (*Arbutus Menziesii*), and a portrait of a fine specimen which had grown to a great height in the forests of northern California; in the present issue we are able to reproduce a photograph of the trunk and principal branches of the famous Madroña-tree which grows on the slopes of Mount Tamalpais, in the grounds surrounding the reservoir that supplies the town of San Rafael, in Marin County, with water. It is the largest of its race of which we have any record, one of the most marvelous trees now standing on this continent, and, from its position within the bounds of a carefully preserved piece of public property, one of the few really great trees of the country which may be expected to continue for many years to astonish and delight the lovers of nature and to live out its natural life. What the age of this tree is no one can conjecture; it has already attained a height of more than a hundred feet; the branches cover in one direction the span of seventy-five feet, and of ninety feet in the other direction, and the mighty trunk girths twenty-three feet at three feet above the surface of the ground.

For these measurements and for the admirable photograph from which the illustration has been made, we here offer our thanks to Mr. E. W. Woods, of Sancelito, California, an enthusiastic lover and student of trees.

Color in Rural Buildings.

THE use of color on the exterior of buildings is a subject to which in recent years American architects have given much attention. Foreign examples of strongly colored or polychrome work, both ancient and modern, have been seriously studied; the particular characteristics of our climate and atmosphere have been considered; and it has been recognized that in America, where the air is clearer and the light more intense than in northern Europe, very marked effects of exterior color can be used with good results.

The pale gray stone almost universally employed in Paris is admirably suited to local atmospheric conditions. Every painter knows that the atmosphere of northern France contains moisture enough to make a soft grayish envelope for all terrestrial objects, and to give the sky a soft and rather pale tone; and the so-called Caen stone of Paris is neither too white nor too dark to fit well into the scheme which the great colorist, Nature, has laid out. In Holland and England, where the air is still more moist, the deep red so commonly used for roofs is equally appropriate, coming out well against the heavy skies and harmonizing with the strong dark greens which much dampness produces in foliage and grass. But go to the south of France and to Spain and Italy, where the air is clearer, the light more forcible, and the sky bluer, and you will find that the best colors, and those most generally employed, are vivid yet light—chiefly whites and yellows, which, as a painter would say, have the same "value" as the clear bright greens of the

vegetation, the yellows and whites of the soil, and the blues and whites of the heaven. And in the roofs a clear, not heavy, shade of brown has generally replaced the deep red of northern countries—a tone which is not too pronounced to mate with the lighter ones, but is welcome among them as giving an accent of contrast and relief. If a bright red roof is wanted in a southern climate, it ought to be a bright light red—not the bright deep red of Holland, where a pale red would seem too weak for Nature's tones, and a clear brown would hardly tell in the landscape at all.

Our summers in the latitude of New York are as warm as those of southern France, and, indeed, New York actually lies in the latitude of Madrid and Rome. Our winters, of course, are very much colder; but atmospheric conditions do not change to correspond with isothermic lines; and all the year round, even in northern New England, we have vivid skies, a pellucid thin atmosphere and a clear bright scheme of natural color. Therefore, as our architects now know, the teaching of the south, not of the north, of Europe should be followed in the external coloring of our buildings.

Much has been done to improve and vary this coloring during the past ten or fifteen years. The streets of New York, for instance, are no longer given over to the dark brown sandstone and the strong red brick which used to rule supreme. Sandstones and limestones of paler colors, pale reddish, yellow and light brown bricks, and even bricks which are almost orange-colored, have been largely adopted, vastly to the increase of beauty of effect. In Boston a quite bright red sandstone is common, light brick is also much used, and Richardson's example has been often followed in the matter of polychromatic treatment. Of course, every result is not good; but we can note gradual growth toward true excellence in the color treatment of our city buildings; and, we are glad to say, white is again coming into favor for buildings in the country.

Once upon a time, of course, white was almost universally used in such buildings. They were almost always of wood, and whether they were simple box-like cottages, pillared Jeffersonian homes, or pseudo-classic or pseudo-Gothic churches, they were almost always given a coat of pure white paint. Then came a reaction, for which, we imagine, Downing was largely responsible. His admiration for English rural architecture was rightly very great, and his perception of the crudeness of such architecture in America was naturally keen. But in trying to reform the ways of his fellow-countrymen he did not realize that under different natural conditions different expedients are to be advised. Many chapters in his *Horticulturist*, and many pages in his books on rural building, are devoted to decrying the use of white paint. After his day we had a long reign of dismal hues—dark grays and sombre browns and dusky yellows—which, if they did not always painfully afflict the eye, did not give it pleasure or harmonize well with the surrounding colors of nature. Later there came a reaction, and in the days when villas were built in fantastic forms and profusely adorned by the jig-saw, bright hues of a wrong kind were applied, two or three, or even more, together, to add in tint to variety in form.

But it was soon felt that decidedly too much variety had been achieved, and another reaction came about. Painting was largely dispensed with; staining was substituted in a way which sometimes gave a pleasing and naturally mellow look, but sometimes revealed a mistaken desire to imitate the effects of age; or these effects were left to produce themselves: the shingles which were generally employed instead of the long-universal clapboards were left to "weather" into various tones of gray, and merely the trimmings and shutters of the house were painted.

These last-named practices are still pursued, but paint has come back again into greater favor, largely as a result of the liking for "Colonial" fashions of building in which clapboards are more appropriately used than shingles; and, owing to the same cause, as well as to a better understanding of the requirements of our atmosphere, clear light tones are generally preferred. We have come to see that our great-great-grandfathers were wiser than we once thought when they painted their stately Colonial houses a pure white or a pale yellow, and relieved them with trimmings and shutters of a darker color; and also that the farmer who had liked his cottage white, probably merely because it looked cleaner thus, was unwittingly more artistic than his descendant, who thought it more dignified and refined to live in a dark gray house with a deep red roof.

The natural tone which weathering gives to shingles of good quality is rarely inharmonious except where the air is strongly impregnated with salt, and portions of the house therefore get an almost absolutely black color that is certainly not desirable

But, as has been said, we realize now that shingling is not appropriate with every style of house, and is usually best on those of relatively modest size and aspect. There are many cases when painted clapboards are much better.

Of course, a white house, standing by itself in a glare of sunlight, is unpleasant to look upon close at hand, and makes an inharmonious spot in the landscape when seen from a greater distance. But this is a trying situation for any house to occupy; when it must be borne with, stone or brick, of not too deep a color, is a better material than wood; and if wood must be used and staining is not desirable, then the best thing is to choose some tint which is nearly, but not quite white,—a pale yellow or a delicate, not slaty, shade of gray. But even a very large house can be white if it is surrounded by trees, for their shadow will temper its glare. Indeed, a white house thus shadowed makes, we think, as a rule, a more beautiful effect in our landscapes than any other. There were recently exhibited in this city a number of pictures by Mr. Leonard Ochtman, painted in Connecticut, and representing pastoral scenes. In many of them the main feature was a white house, or group of houses, accompanied by umbrageous Elms. The artist had not in any degree toned down the color-scheme of New England summer nature, or tried to mitigate the whiteness of his buildings; yet the effect of his canvases was eminently harmonious, and one felt that the color-scheme would have lacked a most desirable note had the houses been anything but a true white. The pictures of many other artists have, in recent years, shown us similar things, and we can discover them for ourselves if we know how to use our eyes when we are actually looking at American landscapes. Notice, for instance, if you ascend the Hudson River, which of the houses on the hill-sides look best, and you will decide that it is almost always the white ones. None looks better than the old Catskill Mountain House, perched up on its steep bluff with a line of forest behind it. Compare its effect with that of the dull-colored Kaaterskill House not far away, and you will be glad that its original color has not been changed.

Indeed, there may be cases where a house can stand apart from trees and yet look well if painted white. This, I think, is when it stands on the edge of the sea, with strong blue color below it, and probably stretches of brilliant white beach to support its own whiteness. Certainly we should not want the color of our whitewashed lighthouses changed. It is this color, quite as much as their conspicuous simple forms, which makes them such welcome additions in any sea-shore view. A further proof of the appropriateness of white in our climate is the beautiful effect that sails make when seen against the shore. We have been foolish enough to imitate the architectural coloring of Holland under our very different skies; but at least we have never felt that our fishing-craft, yachts and sail-boats would fit better into the landscape if their sails were stained with those brownish and deep yellowish tones which harmonize so well with Dutch shores and skies and waters.

Of course, to cover a house with painted clapboards is not the only way of having it white. We might well make a more frequent use than we do of plaster and stucco in their various forms, and a half-timbered house with stuccoed panels of white would often look admirably where one all of white would be too glaring. And then there are limestones and marbles among more costly materials.

Even if absolute white is not chosen, and naturally I do not recommend that it should be used to the exclusion of all other colors, care should be taken to get a tone that is neither too deep nor too strong. Very pale yellow is often the best possible color, while, in the same situation, a deeper yellow would look crude, a neutral tint would be ineffective, a harsh brown or gray would conflict with Nature's scale of color, and a deep red roof would only make matters worse. Gray, if it is light and pure enough, is a very good color, too, especially when relieved by white trimmings and very dark green blinds, and is, indeed, perhaps the best color for houses which stand in exposed situations. It may be so chosen as to give practically the same effect that the weathering of shingles produces under the best climatic conditions.

Brick, in very pale yellow tones, is an excellent material for country houses; and, of course, any color that can be applied to wood can be given to bricks as well, and many of them are better than the strong red which once seemed their only natural hue. Very successful in color is a large old brick mansion in the neighborhood of Boston which for generations has been painted a clear and distinctly lavender gray, the painter never being allowed to mix the tint without one of the family standing by to see that he does not get it too dull and impure.

New York.

M. G. Van Rensselaer.

New or Little-known Plants.

New Orchids.

CYPRIPEDIUM × "MONSIEUR FINET," Hort.—A very distinct hybrid raised between *C. callosum superbum* and *C. Godefroyæ* by Monsieur Regnier. It is said to be one of the most beautiful hybrids known, and to be comparable with *C. × tessellatum porphyreum* and *C. × Van Houttei*. The flower is lined and spotted with green and rosy purple on a paler ground, which becomes white toward the margin of the dorsal sepal. It is quite intermediate in shape.—*Orchidophile*, 1891, pp. 321, 333, 335, with figures.

CYPRIPEDIUM × BOSSCHERIANUM, Hort.—A hybrid raised by Monsieur Ch. Vuylsteke, of Loochristy, Ghent, Belgium, between *C. Spicerianum* and *C. barbatum superbum*. The dorsal sepal is very broadly rounded, strongly reflexed at the sides, bright at the base, white above, with deep purple midvein and fine light purple nerves on either side, with paler transverse reticulations. The petals and staminode are much like those of *C. Spicerianum*, except that both are rather flatter, and the lip is about intermediate in character.—*Gardeners' Chronicle*, January 2d, p. 11.

CYPRIPEDIUM × DECORUM, Hort.—A hybrid raised by Monsieur Jules Hye-Leysen, of Ghent, Belgium, between *C. × Sallieri Hyeantum* and *C. Lawrenceanum*. The dorsal sepal is deep brown, shading into dark green toward the base and into pinkish magenta near the white margin. The lip is metallic brown in front, and paler behind, and the lip garnet, flushed with mauve.—*Gardeners' Chronicle*, January 2d, p. 11.

LEPTOTES BICOLOR, Lindl., var. BREVIS, Rolfe.—A distinct variety with short broad segments, and the front lobe of the lip broadly elliptical, obtuse, and pure white instead of purple. It appeared with Messrs. B. S. Williams & Son, of Upper Holloway, in a batch of the ordinary form.—*Gardeners' Chronicle*, January 9th, p. 42.

CYPRIPEDIUM × COWLEYANUM, O'Brien.—A handsome hybrid raised by Mr. Cowley, in the collection of F. G. Tautz, Esq., of Ealing, by crossing *C. Curtisii* with the pollen of *C. niveum*. It is fairly intermediate in character, and bears some resemblance to *C. × Marshallianum*. The flower is white, the dorsal sepal with about fifteen clear dark purplish crimson, somewhat dotted, lines, and tinged with rosy purple between them, and the petals covered with small dark purplish crimson spots. The lip is bright rosy purple, and the staminode dark purple, with a white margin.—*Gardeners' Chronicle*, January 16th, p. 73.

CYPRIPEDIUM × ENSIGN, O'Brien.—A hybrid raised in the collection of C. Winn, Esq., of Birmingham, between *C. × Harrisianum* and *C. barbatum Crossi*. Thus it is *C. × Harrisianum* crossed back with one of its parent species. It is said to resemble the first-named, but with a more shiny surface, and a more rosy hue over the petals and dorsal sepal.—*Gardeners' Chronicle*, January 16th, p. 73.

PHALÆNOPSIS SCHILLERIANA, Rchb. f., var. PURPUREA, O'Brien.—A bright rosy purple variety, with flowers darker than usual. It appeared with Messrs. Hugh Low & Co., of Clapton.—*Gardeners' Chronicle*, January 23d, p. 105.

EPIDENDRUM GODSEFFIANUM, Rolfe.—A species belonging to the *Encyclium* section, imported with *Cattleya labiata* from northern Brazil by Messrs. F. Sander & Co., of St. Albans. The sepals and petals are light green, somewhat nerved with light brown, and the lip white, the front lobe being lined with bright rose-purple, and the side lobes similarly marked at their base. The apex of the column is orange-yellow.—*Gardeners' Chronicle*, January 30th, p. 136.

CYPRIPEDIUM × GIGAS, O'Brien.—A hybrid raised in the collection of C. Ingram, Esq., of Godalming, by Mr. Bond, from *C. Lawrenceanum* crossed with the pollen of *C. Harrisianum nigrum*. It is intermediate in character, though somewhat approaching the seed parent in its flat, circular upper sepal, which is very dark chocolate at the base, lined with the same on an emerald-green ground above, and

with a broad pure white margin. The petals and lip approach those of the pollen parent in character, but the staminode is more reniform in shape.—*Gardeners' Chronicle*, January 30th, p. 136.

CYPRIPEDIUM × SWINBURNI, O'Brien.—A hybrid raised by Messrs. Heath & Son, of Cheltenham, between *C. insigne Maulei* and *C. Argus Moensii*. The dorsal sepal is green at the base, with lines of distinct brownish purple spots which decrease in size toward the broad white apical margin. The petals are greenish white, tinged with white on the outer halves, and with a number of dark purplish blotches, as in *C. Argus*. The lip is green, tinged and netted with reddish brown, and the staminode yellow with a green veining in the centre.—*Gardeners' Chronicle*, January 30th, p. 136.

Kew.

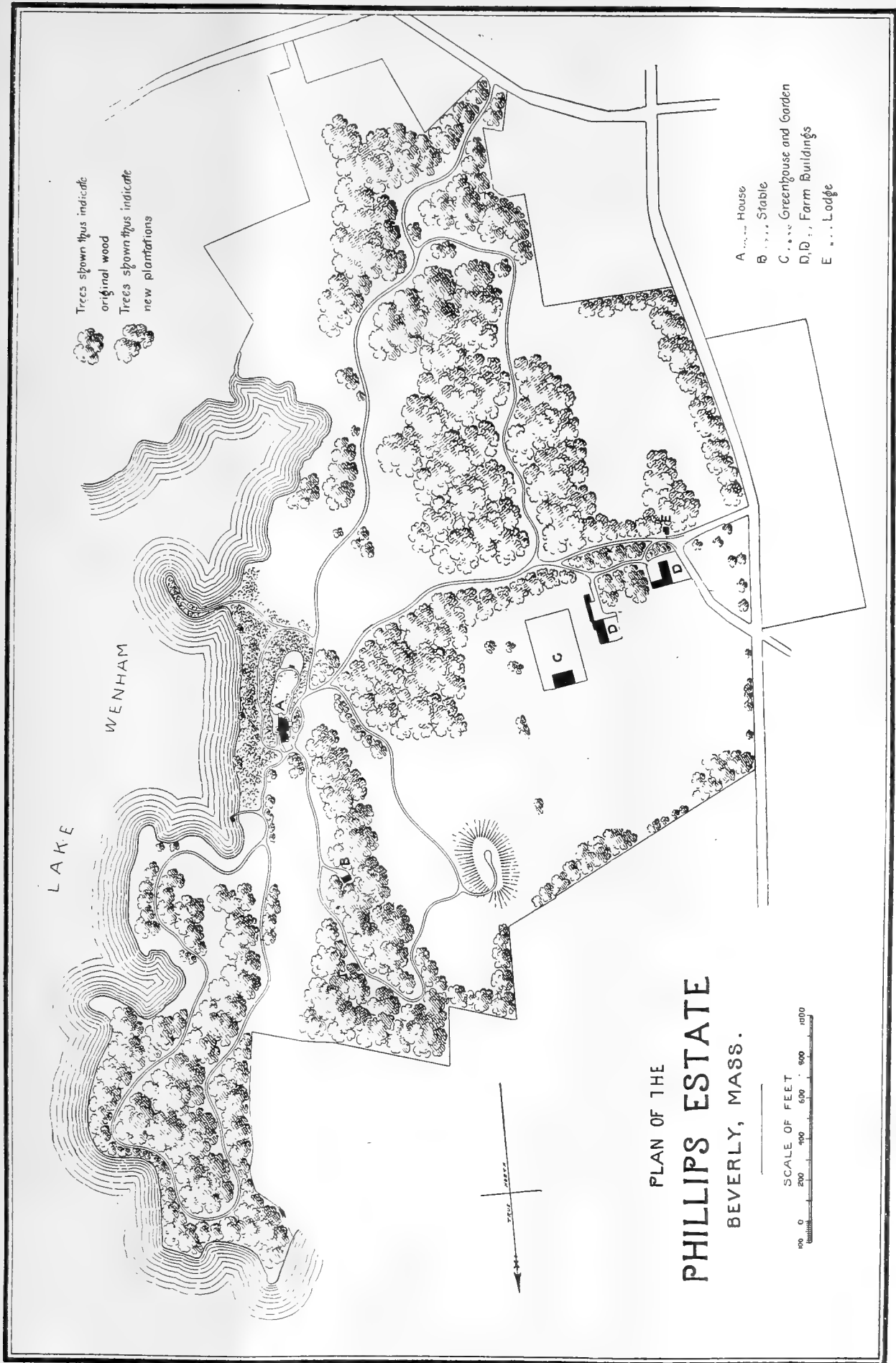
R. A. Rolfe.

Foreign Correspondence.

London Letter.

FRUIT FROM SOUTH AFRICA.—A further consignment of fruit from South Africa arrived at Southampton on the 6th instant, and was disposed of by auction sale at Covent Garden Market. The condition of the fruit was so good that really fancy prices, even for London, were realized. For instance, boxes containing from thirty to thirty-five apples fetched seven shillings and sixpence (nearly two dollars) each, while pears in some instances sold even better, one case containing forty-two fruits realizing thirty-four shillings. Melons brought about three shillings and sixpence per box, and grapes fifteen shillings per box of twenty pounds. These prices, especially those of apples and pears, are probably much higher than the present condition of the fruit market would warrant, bar favor. At the same time, there can be no doubt that good fruit of this kind will find a ready market in England any time between February and June. That this is the case is shown by the rapid development of the trade in Tasmanian fruit, which, according to the following extract from a daily paper, will shortly arrive in England in large quantities: "The P. & O. Steamship Company have arranged that their steamers shall make twelve visits to Hobart, Tasmania, for the purpose of bringing to England a consignment of 240,000 bushels of apples. The first lot has been dispatched, and will arrive in London toward the end of the present month. The fruit is packed in cool chambers during the voyage." At this rate there is some hope that we shall soon be able to purchase such delicious tropical fruits even as the durian and the mangosteen in Covent Garden Market as fresh and as palatable as they are when newly gathered from the tree.

PLANTS FOR HOUSE DECORATION.—This was the subject of a short paper by Mr. John Wills, which was read at the last meeting of the Royal Horticultural Society. Mr. Wills has for many years held a first position among the horticultural "decorators" of England. He stated that the grand displays now produced at balls, festivals, etc., by means of plants and flowers were scarcely known twenty years ago. About that time Sir E. Scott gave *carte blanche* to Mr. Wills, whose work occupied three days. The Marquis of Bristol soon afterward had an elaborate arrangement in which no less than six tons of Ivy alone were used. Lady Sutton spent £1,000 in one month in decorative work with plants, and on one occasion a Belgravian magnate spent £1,400 on a single effort! All good for trade, no doubt, and that is the best that can be said of displays of this kind. Some of the statistics given by Mr. Wills are interesting. He found on inquiry that there are at least 300 nurserymen and market-gardeners in England who grow for Covent Garden alone; also that 20,000 van-loads of decorative plants were sent to Covent Garden last year. The plants which Mr. Wills has found most serviceable for the decorator are *Livistona Sinensis* (*Latania Borbonica*), *L. australis*, *Phoenix rupicola*, *Rhapis*, *Kentias*, and *Cocos Weddelliana* among Palms. He also recommended As-



paragus plumosus, Dracænas, Aspidistra, Hydrangea, Ferns, Crotons, Pandanus, Cycads, etc. It would take an enormous number of such plants to justify a charge of £1,400. Mr. Wills, however, in his special efforts uses such plants as Nephentes, Orchids and all kinds of flowering plants. I have seen some of these costly arrangements made by Mr. Wills, and they were certainly very beautiful. At the same time one cannot help thinking with Dr. Masters that the art sometimes displayed in the cottager's window is at any rate as pleasing.

FLOWER DYEING.—A few weeks ago a green Carnation made its appearance in the button-holes of the members of a political party in Paris, which consequently became known as the party of the Green Carnation. The badge of the Boulangists was the red Carnation, while the anti-Boulangists wore the same flower, but with its stalk uppermost. The green Carnation attracted some attention on account of its exceptional color, an English daily paper stating that this "new color in Carnations had been raised by a Parisian florist, who was in the way of making a fortune out of it!" The color was really the result of placing the flowers in a dye which soon permeated the petals and gave them an artificial color. In the *Gardeners' Chronicle* this week is an interesting account of some experiments of this kind which were made by Mr. W. Dornington and Mr. Brockbank. They procured some aniline dyes, which were dissolved in water to about the transparency of claret. In these solutions flowers of various kinds were placed, or rather their stalks, for the dyes did not change the colors of the flowers when simply immersed in them. Lily-of-the-valley became beautifully tinged with pink or blue in six hours; Narcissi changed from pure white to deep scarlet in twelve hours, and yellow became striped with scarlet in the same time. Flowers of Lapageria, Cœlogyne, Calla, Cyclamen, Snow-drop, Hyacinths, Hellebores, Tulips and other plants were treated, and gave equally striking results. White Tulips were changed to pink, blue, green or purple in a few hours, and White Lilac became pink or blue. The blue Rose, blue Chrysanthemum and red Daffodil can therefore now be made to order!

BORDEAUX MIXTURE.—A report upon the experiments made for the prevention and cure of the Potato disease (*Peronospora*) has just been published by Messrs. R. Veitch & Son, Exeter. They experimented on ten varieties of Potato, applying the mixture twice, once in June and again in July, the result being an "unqualified success, for it acted as a preventive where the disease had not appeared, and as a cure where it had done so, at the same time showing itself to have had a fertilizing effect as well." Messrs. Veitch state that the use of the mixture for potatoes last year was "a great success in many parts of America, and almost universally so throughout France, where the idea was first carried into practice." A committee of the Royal Agricultural Society of England have recommended that renewed experiments on Potatoes with this mixture be taken in hand again during the forthcoming season, and Mr. Carruthers, F. R. S., of the British Museum, has undertaken to conduct an inquiry into the exact nature of the effect of the mixture upon the *Peronospora*. Messrs. Veitch urge cultivators generally to give this Bordeaux mixture an extended and impartial trial. The results obtained by Messrs. Sutton & Sons, which I mentioned in a previous letter, were almost the opposite of those obtained by Messrs. Veitch. Evidently, therefore, the time for a verdict as to the value of the mixture in England, at any rate, has not yet arrived.

RHODODENDRON SEABRIFOLIUM.—I forget if I have mentioned this new Chinese Rhododendron, which flowered at Kew for the first time last year, when it was figured in the *Botanical Magazine* (t. 7159), where it is described as an erect unbranched plant, with scabrid, hairy ovate-acuminate leaves two and a half inches long, and a compact head of white flowers one and a half inches across. Neither this description nor the picture which accompanied it does full justice to the plant as it is now at Kew. It has six

branches, each bearing a terminal cluster of exceedingly pretty white flowers, slightly flushed with rose, and with pink anthers. The "legginess" of the plant last year was owing to its not having been stopped. With a little management it may be made bushy enough, and as it flowers freely early in the year it will be useful. So far, it has only been tried in a greenhouse, but it may prove to be quite hardy in England, for, according to Delavay, who discovered it in Yun-nan, it grows at a higher altitude there than *R. decorum*, a species very like *R. Catawbiense*, and which we also owe to Delavay. Now, *R. decorum* has stood the severe weather of the present winter in the open as well as the hardiest of Rhododendrons. We have in cultivation at Kew, beside the two species mentioned, *R. Delavayi*, said to be one of the handsomest, *R. lacteum* and *R. racemosum*. These are all from Yun-nan.

AZALEA CALYCIFLORA.—This is one of the forms of *A. indica*, and nearest that generally known as *A. amœna*, of which we possess now several pretty seedling varieties, which were raised by an English amateur, Mr. Caldwell. *A. calyciflora* differs from these, however, in having larger flowers and their color, which is a soft salmon-red. The habit of the plant is like that of *A. amœna*; like it, too, it forces well. By the way, has the last-named Azalea ever been tried out-of-doors in your country? Here it is quite hardy, forming a beautiful little shrub which is pretty at all times, and emphatically so when clothed with its rosy purple flowers. Another of the same type, known in gardens as *A. obtusa*, is equally hardy.

London.

W. Watson.

[*Azalea amœna* is well known in this country, and perfectly hardy in the latitude of New York.—Ed.]

Cultural Department.

Flower Garden Notes.

IT is in season to note a few of the desirable plants for the summer garden, both annual and perennial. We have many plants that are perennial if wintered over where the space can be spared for them. One of these is the beautiful Grass, *Pennisetum longistylum*. Last summer, when planted the length of a wide border in front of greenhouses, it was very attractive, and it will be better known in future, though it is by no means new. *Pennisetum* grows about two feet high, and can easily be raised from seed of good quality, but it can also be easily propagated by dividing the roots and starting them in small pots in spring. Our plants are now stored in a cellar with other tender plants and must now be divided and started into growth to produce good effect early in summer. The same is true of the Cannas, called dwarf, the more recent varieties of which are distinctly in advance of all others. The Star of 1891 is now a fine sight in full flower in the greenhouse here. We have eighty plants from one obtained last spring, it propagates so readily by division. A bed of this Canna alone, seen last summer, was very attractive and worthy of reproduction by those who have the plants at their disposal. When planted out, the Canna Star of 1891 grows to a height of about five feet, but under pot-culture it becomes a handsome plant, rarely more than three feet high.

The newer strains of Dahlias are to be recommended, especially the dwarf ones, both single and double. The staking, which is usually necessary with other kinds, is not needed for these plants, as they make a handsome bed of themselves. In this locality Dahlias are a complete failure after the Chrysanthemum fly appears. These insects sting the growing tips of the shoots and buds and that is the end of the display for the season. I have noticed in cottage gardens by roadsides, where the Dahlias can hardly be recognized for the dust that covers them, that they flower freely and the insects do not trouble them.

The Marguerite Carnations are rapidly gaining in favor, and have already passed through the "novelty" stage or crisis, which means usually fifty per cent. single flowers if double ones are promised. These carnations, now offered in separate colors, are fragrant and free-blooming, but to get the most out of them they should be sown at once in heat, if this has not already been done, to be pricked off singly and transferred later to the place where they are to flower. They will need

careful staking to prevent them from becoming storm-beaten when in bloom. Of China Asters tried last summer, Queen of the Market proved the best of all for cutting purposes, and was also the earliest to flower. The stems were stiff and of good length. Peach-blossom is a pretty shade of

pleasing color and as fragrant or more so than any other kind. Mignonette requires a moist soil or plenty of water applied to keep it going all the summer, and then the more they are cut the better the plants will flower, and the same is true of Sweet Peas. There is a threatened scarcity of the supply of Sweet



Fig. 23.—The Great Madroña of San Rafael—See page 146.

pink, and when grown in quantity produced a very pleasing effect, as did also the dark crimson General Jacqueminot, quite the best dark Aster I have met. With Mignonette, the Giant Crimson has proved the best and most vigorous variety indoors and outside in summer. The spikes are large, of a

Pea-seeds, and the price has been raised accordingly by some dealers. These should be among the first seeds sown out-of-doors, so that it is wise to obtain them early. If the flowers are picked clean every day they will continue to appear until frost comes. When once allowed to seed, then flowering is over.

For forwarding the numerous tender annual seeds nothing is better than a gentle hot-bed. When the fermenting material used is four to five feet thick and covered with about six inches of soil, the pots and pans may be plunged in it and receive a gentle warmth that will greatly help germination, and afterward serve as a place for forwarding the young seedlings when pricked out until time for planting out. Those who have only a cold frame in winter should excavate within it to the required depth, and fill this in the spring with fermenting material that has been mixed with leaves a day or two and allowed to become warm. It can then be trodden firm in the frame and used at once for sowing seeds if six inches of soil has been placed on top. This is the best place for sowing seeds of Asters, Stocks, Zinnias, Tomatoes, Peppers, Egg-plants and many more of a like character. The frame may be used in summer for Cucumbers or Melons in places where these do not thrive in the open, as, for example, in this section.

South Lancaster, Mass.

E. O. Orpet.

The Cultivation of Bulbs in the South.

IN the January number of the *American Agriculturist* Mr. Thorpe called attention to the fact that the production of tuberous bulbs and plants for the American and European markets has become centred in one or two localities in eastern North Carolina. He also speaks of the great adaptability of the warm coast plain of North Carolina to the production of bulbs that are now imported by the million from foreign lands, just as the Tuberose was brought from Italy thirty years ago. There is a wonderful future for this favored section in the hands of skillful cultivators. Of Narcissus alone varieties by the hundred and bulbs by the million are imported annually from the south of Europe, all of which could be grown to better advantage in eastern North Carolina at much lower prices than they now cost, and it will be just as easy for growers here to monopolize this culture as they have that of the Tuberose. Many of these Narcissus are too tender for the open air in the northern states, but all can be grown here to sell to the northern florists for forcing purposes. The gorgeous family of Lilies, too, would find here a congenial home. *Lilium longiflorum* is diseased in the north, while here it grows in perfect health. In the black peaty soils of eastern North Carolina the Bermuda Lily, I feel sure, can be grown to a greater perfection of bulb than in the thin soils of Bermuda. Our native *Amaryllis*, which grows so profusely in a wild state, can also be profitably cultivated for the northern wholesale trade. All the gorgeous tribe of *Amaryllis*, which are nursed in pots at the north, can be grown here in the open air, and many of them sell now at prices which would make their culture profitable to the intelligent grower. Roman Hyacinths in this peaty soil develop bulbs of great size and vigor, and they continue to bloom profusely much longer than at the north. The plants begin to bloom here about the 20th of December, and throw up spikes of flowers without intermission till late in March, a season of bloom unsurpassed elsewhere. Here, too, the popular Tuberous Begonias find a long season for perfect development, and their tubers rest unharmed in the ground all winter. *Gladiolus* will ripen two crops on the same land in one season, and make corms of enormous size. *Sternbergia lutea*, the yellow fall-blooming *Amaryllid*, develops a magnificent growth in our mild winters (their season of growth). *Cannas* keep perfectly in the ground where they grow, and can be dug for shipment all through the dormant season. *Caladiums* of all kinds make superb tubers, from the chopped up rhizomes, in our long seasons.

In fact, then, in the whole list of bulbs and tubers now used so extensively, and imported from abroad, there are none that cannot be better grown in the coast region of North Carolina, where the soil is that of Holland and the climate that of Italy.

Raleigh, N. C.

W. F. Massey.

Early Irises.

IRIS HISTRIOIDES is one of the latest additions to the list of early-flowering bulbous Irises. It is a native of Palestine, and has been introduced to cultivation by Herr Max Leichtlin. We are again indebted to the great Baden-Baden gardener for a first-rate plant for the early garden. *I. histrioides* is one of the reticulata group of Irises, and follows *I. Bakeriana* closely in time of flowering, coming into bloom in my garden early in March this season. In this latitude the weather in early March is a very variable quantity, and it is somewhat difficult to describe the habit of plants with experience gained only from those fully exposed to the vagaries of the climate. The first flower from this variety, probably from being caught by very

severe weather, was only one inch high, but later blooms are expanded at three inches, which is rather taller than *I. Bakeriana*. The flowers vary somewhat in color, but are shades of purple, with golden keels and purple markings on a white ground. One especially beautiful one was spotted with deep royal purple markings. There are also said to be white forms of this variety. The flowers are delicately fragrant and thoroughly weather-proof. Frost of fifteen or twenty degrees they heed not at all, high winds they do not nod to, and warmth sufficient to melt snow starts them into activity. The last flower expanded promptly as the last of six inches of snow which had covered them disappeared. It seems to me that this is a charming and valuable plant.

A clump of *I. reticulata* will not be in full flower till early in April. These, while a little later, are among the most charming of early flowers, and are not as commonly grown as they should be. The typical *I. reticulata* is entirely satisfactory, admirable in color, fragrant and hardy. Numerous forms of this have been raised from seeds, one of the most striking being *I. reticulata major*, somewhat larger than the type, with a very beautiful flower of deep honest purple, with golden markings. This is an English variety, and the best form yet seen by me. The form which I know as *I. reticulata Krelagei* has a reddish cast, and does not appeal pleasantly to my color-sense. *I. reticulata* seems to be a favorite plant with Herr Leichtlin, and he has raised a number of new forms, some of which are said to be very handsome and satisfactory blues, but these have not been grown in my garden.

I. Danfordiae is a yellow-flowered Iris of the same group, which seems somewhat more shy in blooming. At least the bulbs in my border are again not inclined to flower. Perhaps their location is too wet and cold, for these Irises seem happier in a sunny and rather dry border, sheltered from north winds.

We are promised a wider range of color in *Iris Bakeriana*, reaching from the blue of the type to white. Probably the varieties will be no handsomer than the charming one first introduced, the falls of which are so beautifully marked with a rich velvet-blue on ground of white and light blue. This Iris on second trial proves entirely hardy even in wet soil, and increases rather rapidly by offsets. If seed were desired it would be necessary to grow it under shelter, as it flowers so early in the year that no seeds are set in the open. The flowers are very lasting, and, though opening in late February, they are not affected by the hard weather of that season. Usually they retain their form for a fortnight.

Elizabeth, N. J.

J. N. G.

Notes on Begonias.

BEGONIA BISMARCKI.—This comparatively rare and beautiful garden hybrid is one of the best winter-blooming varieties we have. Its constitution is very robust, and partakes generally of *B. rubra* in character. The leaves, however, are larger, and much more divided. The panicles are large, and so, too, are the individual flowers, which often measure two or more inches across. The male flowers, which, as in all Begonias, open first, are comparatively small, and it is not until the female flowers display themselves that their full beauty is seen, the large seed-vessel, with largely developed, bright red wings, being their most conspicuous feature. The petals are light rose, incurving slightly—a form which adds considerably to their effect. The plant is easily propagated, the cuttings bloom in the propagating-bed and grow into neat plants at once. For bedding it has exceptional merit, since very few of its class bloom well during summer. As a cut-flower variety it is excellent, the flowers lasting a long time.

Of the many fine varieties raised from *B. semperflorens* the large red one, with its unwieldy catalogue name of *Begonia sempervirens robusta gigantea rosea*, is the best. It is a good, all-around Begonia, either for bedding in summer or blooming in the greenhouse in winter. It makes a handsome specimen from the time it is rooted as a cutting, and every shoot blooms from the first growth made. The leaves are bright shining green, nearly round, and five to six inches in diameter. The stems, petioles and foot-stalks of the flowers are red, which adds somewhat to their beauty. The flower-stems are stout, erect, long enough for decorative work, bearing dense panicles of large vermilion-red flowers. I have some fine specimens, less than one year old, in eight-inch pots, which are more than three feet in diameter by two feet high.

The well-known *B. glaucophylla scandens* (Comte de Lenninge) is very generally used for basket-work; but for draping a pedestal it has a unique value. Two plants which I have in view are grown in large pans, in which they have been two years, and these set on pots, which they drape completely.

They are now covered with short dense panicles of brick-red and white flowers. The female flowers, with white seed-vesicles and large red wings, are in beautiful contrast to the red male flowers, and handsome white-margined, glaucous foliage. To have this species bloom well in winter a little rest or partial drying should be given after blooming, say, from June to August. A few cuttings taken now and rooted would make, if placed five in a pan, a neat specimen for next winter, but would not bloom so well as two-year-old plants which had been rested in summer.

B. Verschaffeltiana is a rather common, but handsome hybrid between *B. carolinæfolia* and *B. manicata*, and though it is intermediate in character, it is evidently more robust than either parent. It is tall, coarse and unsightly as an old specimen, but when well grown from year to year as a cutting, it makes a splendid plant. The leaves are palmate, about one foot in diameter, very similar in shape to those of *B. manicata*. The cymose panicles of lilac-colored flowers have a clear and graceful spread of eighteen inches or more, and are supported on stout stems two feet long. An individual panicle will remain well in bloom for two months, and as flower-stems appear in succession, both from the main stem and side shoots, the plant may be said to bloom the whole winter. Certainly it has presented an effective display of bloom for more than three months. The whole plant presents a one-sided appearance, no matter how it may be exposed to light. This, however, appears to be rather an advantage, as the plants are faced about.

Wellesley, Mass.

T. D. Hatfield.

Arachnanthe Cathcartii.

THIS remarkable and beautiful Orchid is, unfortunately, but too rarely seen in flower. Only in a few collections, apparently, does the gardener seem to possess the knack of inducing it to bloom annually. Recently, at one of the meetings of the Royal Horticultural Society in London, a spike bearing three large flowers was exhibited by Mr. W. Iggulden, of Marston Gardens, Frome, who grows the plant successfully, and who informed me that previous spikes produced by the plant had borne four flowers. Individually these are about three inches in diameter, with roundish oblong sepals and petals, creamy outside, and pale yellow on the inner surface, which is transversely marked with wavy and often confluent bands of deep reddish brown, which give the segments a beautiful arachnoideous appearance, like that of some *Stapelias*, *Huerrias* and allied genera of *Asclepiadaceæ*. The lip is remarkable; the small side lobes are roundish, intumed and streaked with crimson or red. The middle lobe, however, is much larger, and reminds one very forcibly of the sole of a horse's hoof, with its ridges and depressions. The border is buff-yellow, while the centre is of a clear shining white—the whole being very fleshy and brittle, and easily movable at the slightest touch or breath. The plant itself grows several feet long, like *Renanthera coccinea*, having stems as thick as a lead-pencil. The leaves are borne chiefly on the upper portion, and are six to eight inches long, strap-like and very leathery, with an oblique two-lobed apex.

The generic name, *Arachnanthe*, established by Blume, has not yet universally commended itself to gardeners, who in the matter of names are most conservative, and in this particular instance prefer the older, shorter, but, nevertheless, erroneous name of *Vanda*, applied to the plant by Lindley when describing it in his *Folia Orchidaceæ* in 1853. The differences between *Arachnanthe* and true *Vandas* are palpable enough, and need not be entered into here. Suffice it to say that for many years the species now under consideration has been considered as not a *Vanda* at all. The late Professor Reichenbach therefore established a new genus expressly for it, and called the plant *Esmeralda Cathcartii*. Bentham, however, discovered that *Esmeralda* of Reichenbach was practically identical with the *Arachnanthe* of Blume; hence in that standard work, the *Genera Plantarum*, the name *Arachnanthe* has been retained in preference to *Esmeralda* on account of its priority.

The discovery of *Arachnanthe Clarkei* is claimed by Sir Joseph Hooker, who, in describing the plant in the *Botanical Magazine* under tab. 5845, says: "It is a native of hot, damp, shady valleys in the eastern Himalaya, delighting in the neighborhood of waterfalls where exposed to constant humidity. . . . It was discovered by myself in 1848, and transmitted to the Calcutta Botanic Gardens, where, after flowering, it was sent off to England, but did not survive the voyage." Reichenbach, however, in reference to the discovery, states in the *Xenia Orchidaceæ* that "long before the expedition of Drs. Hooker and Thomson, Dr. Lindley had received it from Griffith with

numerous flowers of other curiosities preserved in large glasses of alcohol." Although numerous attempts were made to introduce living plants, the failures to do so were many. It appears, however, that at length Messrs. Veitch were not only successful in obtaining living specimens, but were the first to flower the plant in March, 1870, and in October of the same year a plant six feet high produced several flowers in the collection of Mr. C. Stead, of Baildon, near Leeds.

At one time great difficulty was experienced in the cultivation of *A. Cathcartii* (which is named after Mr. James F. Cathcart, who was one of the earliest explorers in the eastern Himalayas), but now that its wants are better understood, it ought to be managed with tolerable ease. It may be either trained on a wall or grown in a pot filled with clean crocks, the surface of which should be covered with fresh sphagnum. In the latter case it will be necessary, owing to the rambling habit of the plant, to put a stick to it. There should always be plenty of moisture in the atmosphere, and if the upper portion of the plant is allowed to assume a more or less horizontal position there is, for some reason or other, more chance of flowers than if the shoots are trained bolt upright. The thermometer in the winter months should register from sixty to sixty-five degrees, Fahrenheit, at least during the day, with a drop of only a few degrees at night-time. In the summer months this matter will be more easily regulated, but attention should then always be given to watering and occasional syringing, so as to supply continually the moisture which must inevitably go off in evaporation, especially if air is admitted into the houses to any extent.

Isleworth, London.

John Weathers.

Chrysanthemum Blight.

IN an article on Fungus Troubles in the Cutting-beds, published in GARDEN AND FOREST February 24, 1892, page 91, Dr. Halsted calls attention to the severe blighting of *Chrysanthemum*-foliage and damping-off of *Chrysanthemum*-cuttings due to a fungus of the genus *Septoria*. A *Septoria* was also found abundant last fall on *Chrysanthemums* at the station and at greenhouses in this vicinity. Specimens of this *Septoria* submitted to Dr. Halsted for examination were found to be identical with the one referred to in the article above mentioned. During the winter some experiments have been tried for the purpose of controlling this disease, and at least one of the fungicides used promises to give good success.

Cuttings from diseased plants were struck about January 1st and potted off in due time. The blighted foliage was removed February 8th, and the plants were divided into three series. Series 1 was sprayed once a week with potassium sulphide; series 2 was sprayed once a week with ammoniacal solution of copper carbonate; series 3 was left untreated for comparison with the other two series. Without giving detailed notes of the experiments, it may be said that the potassium sulphide solution has given good results, but not so good as the ammoniacal solution of copper carbonate. Plants treated with the latter remedy show less of the disease, and are much more thrifty and vigorous than are the same varieties of series 1 and 3.

Further experiments with other fungicides are also in progress, and it is expected that the results will be published when the work is completed. Attention is here called to the beneficial effects which have thus far attended the use of the copper carbonate solution, with the hope that *Chrysanthemum*-growers may be led to make further tests of this remedy. It may be well to state that excessive or careless use of the remedy has proved injurious to the foliage of some plants. In the experiments here reported, however, no injury to the foliage is apparent. The solution is, of course, applied to all parts of the plant in a very fine spray without drenching them. The formula used is five ounces of copper carbonate dissolved in three pints of strong ammonia (twenty-six per cent.) and diluted to fifty gallons. A convenient way is to dilute the mixture to six quarts, and keep this strong solution on hand in tightly corked bottles. When the dilute solution is needed for use it may be easily prepared by adding a gallon of water to one pint of the strong solution.

Geneva, N. Y.

S. A. Beach.

Manettia bicolor.—This pretty winter-blooming greenhouse climber, although very common, is rarely well grown. The best success is secured when young plants are grown all summer without blooming. Old plants, when cut back, never break well at the bottom and always look ragged. I have usually grown my specimens in pyramidal form, by taking long, pliant stakes and tying them in at the top, but it always appeared to me that the plant, unable to reach its limit of growth, became top-heavy. This winter I placed one near

a large circular iron support, of which it has taken advantage, and is now well on toward the roof, blooming every inch of the way. Next season I hope to have two or three plants at the base of this support and expect to see them mount clear to the roof. The *Manettia* can be increased from seeds, which ripen freely, or from cuttings.

Acacia Drummondii.—No *Acacia* can be so easily propagated from cuttings as this one, a very pretty and distinct species from Swan River. This, taken with the fact that it makes a very neat specimen and blooms while small, should make it a close competitor for popular favor with the more common *Cytisus racemosus*. The leaves, with a very short petiole, bear twin pinnæ, with very few obtuse glaucous leaflets. The drooping cylindrical spikes of yellow flowers look very much like the male catkins of a Willow. This, as well as other *Acacias*, should not be planted in the open soil unless the plants have a well-developed ball of roots. Until that time they should be plunged in pots, where an abundant supply of water at all times can be given. Peaty soil is generally recommended as most suitable, but I find these plants are not at all fastidious in this respect. Any good loam will do, free from fresh manure.

Wellesley, Mass.

T. D. H.

Correspondence.

Grafting.—I.

To the Editor of GARDEN AND FOREST:

Sir,—The interesting paper of Professor Bailey on grafting suggests some experiences corroborative of his judgment that grafting is not a devitalizing process.

When I bought the farm which I have had since 1871, its former owner showed me a small Pear-tree which he had planted six years before, and which had made no apparent growth. I pruned, fertilized and watched it for several years. In the spring it opened its leaves, it shed them in autumn, but it made no visible growth of wood. I then removed it to a seemingly better position, to see if change might awaken it. Digging it up carefully I could not see either in roots or top any indication that they had increased in size a particle since taken from the nursery. It was a case of complete vital inertia. For nearly ten years longer it stood unchanged. It merely lived, and bore an annual crop of leaves without growth. Some years ago, while top-grafting other trees with the Kieffer Pear, I cut off all the branches of this dormant tree and inserted in their stumps cions of the Kieffer. These were set in April. Every one of them grew, and the next October many of them were over five feet in length. From the date of this grafting this inert Pear-tree has grown vigorously, its trunk has trebled in diameter, its branches spread luxuriantly, and in 1891 it bore a bushel of fine fruit.

In a Pear-orchard, which I planted in 1872, stood a Bartlett tree some five feet high with a small branched top. Yearly it blossomed, but did not grow. I pulled off the blossoms annually to direct its energies to the development of wood, but it failed to do more than blossom and bear a few leaves. To encourage it I let it bear two or three pears; these were fine fruits. But even this indulgence did not improve its disposition; it would not grow. In April, 1886, when top-grafting, a neighbor came to learn the art. I had finished my work, but my obstinate little Pear-tree stood handy, so I sawed it off to give my friend a lesson in grafting. He stuck into it a couple of Kieffer cions, and under my instructions completed the job. Those grafts grew strongly; in a couple of years I cut away one of them, and the other is now ten feet high, and was last year so burdened with fruit as to be in danger of breaking down.

I could give many other illustrations in Apple and Pear trees of the evident vitilization of the stock by the graft. The Kieffer Pear especially seems as if its vitality will revitalize any Pear-stock on which it may be worked. It shows strong growth on all Pear-stocks, but stronger on some varieties than on others, proving that there is a difference in congeniality of temperament. I have top-grafted the Kieffer on the Bartlett, Clapp, Sheldon, Anjou, Lawrence and many others. On the Sheldon and on the Mount Vernon the union of the cion with the stock is so intimate and complete that it needs close inspection to perceive where the junction is made. In 1891 the top-grafts on all these trees were so loaded with fruit that many of them broke down; but in no instance did this breakage occur at the point of union. Such has been the case in my Apple-orchard, where nearly every tree was top-grafted after ten years of growth. Here many limbs are broken by last summer's crop,

but there are no breaks at the junction of stock and cion. This, like a splice, seems to be the strongest part.

In these top-graftings it has been of interest to note the influence of the stock upon the graft. The Kieffer Pear has characteristics so marked as to be always recognizable, but these are in some degree modified by the habit of growth of the variety on which it is worked. The Kieffer graft grows differently on a Sheldon or a Clapp from what it does on Lawrence or Anjou. It also varies in the quality of the fruit. With me it is much better on the Seckel and on the Sheldon than on any other stocks I have grafted. I once took some well-ripened Kieffer pears, grown on Seckel stocks, to Mount Holly Fair, and submitted them to the taste of leading horticulturists and fruit experts. They pronounced these Kieffers "among the best pears they had ever tasted."

Among horticulturists it is a matter of dispute as to whether the stock influences the graft. I know of no systematic experiments to decide this question, but I have made many observations. I have been grafting and budding trees and shrubs for fifty years, doing much of this work simply for experiment, and my observations satisfy me that the nature of the stock does influence the nature of the graft. I have trees in my orchard top-grafted with cions taken from one tree—a Red Astrachan—on a neighboring farm. When these grafts on my trees bore fruit scarcely any one would believe the apple to be the same as those on the tree from which the grafts were taken. And these same Astrachan grafts on trees of different sorts differ from each other in habit of setting of the fruit and in time of ripening. I have the early Lippincott grafted on trees which were previously Fallawater and Spy. There is a marked difference in size and quality of the Lippincott fruit on these two sorts. I brought grafts from a tree of the Kentucky Jennetting growing on my old farm in Illinois, and with them here top-grafted a Fallawater-tree. The Jennetting here retains its habit of not opening its buds until after all other sorts in the orchard have blossomed; but I can see no similarity in its fruit here to the fruit which the Illinois tree used to bear. The apples look somewhat alike externally, but there is no other resemblance. In grafting the Grape I have seen a marked change produced in the Ives by grafting it on the Concord. It is larger in cluster and berry, and about five days earlier in ripening.

Vineland, N. J.

A. W. Pearson.

Myosotis palustris.

To the Editor of GARDEN AND FOREST:

Sir,—Near this place the railroad track passes through a piece of moist meadow-land in which a brook takes its rise, and all spring and summer this meadow, as well as the bottom of the brook and its sloping banks down to where it flows into Lake Michigan, are a sheet of beautiful blue, the color coming from an abundant growth of the common European Forget-me-not, which has been naturalized here. Whoever has seen a German meadow, the long grass flecked in a close pattern with the lovely blue *Vergissmeinnicht* and waving in the wind, blending the colors in most pleasing manner, or he who has seen this Wisconsin meadow illumined by spring sunshine will carry in his mind a picture never to be effaced. These plants were naturalized more than a generation ago by an intelligent German, Charles Kuehn.

Nothing is easier than to establish the Forget-me-not. If it is only set where the seed can reach a flowing stream, in a short time it will have spread wherever the water runs. The only danger to guard against will be the uprooting of the original plants, and it will be well to start them where some friendly hand can protect them.

Two Rivers, Wis.

Chas. L. Mann.

Baccharis halimifolia in Atlantic County, New Jersey.

To the Editor of GARDEN AND FOREST:

Sir,—The size to which *Baccharis halimifolia* grows in Atlantic County, New Jersey, is, I think, worthy of notice. Along the borders of the salt-marshes near Atlantic City I have often found it measuring from three and a half to four inches in diameter three or four feet from the ground, and from ten to twelve feet high. It certainly merits the name Groundsel-tree, as it assumes a tree-like form at least in this locality. Its conspicuous beauty in the fall of the year proves that it is worthy of cultivation, as has been already noted in GARDEN AND FOREST (vol. iv., p. 468). As bearing upon the possibility of its successful culture away from salt-water, I may state that I have found it as far as fifteen miles inland, and in places where

there never could have been any brackish water. I may add, however, that it was always found growing along streams or near wet places.

Pleasantville, N. J.

John E. Peters.

Exhibitions.

The Boston Flower Show.

THE annual spring flower show of the Massachusetts Horticultural Society filled its larger hall last week with a collection of flowering plants which, in some respects, was the best seen in recent years at one of these exhibitions, although the low temperature of the opening day made it impossible to bring large specimen plants to the city.

Nothing from the cultural point of view equaled a collection of Persian Cyclamens staged by Mr. Kenneth Finlayson, gardener of Dr. C. G. Weld, of Brookline. The plants were marvels of good cultivation, clean and healthy, with large foliage and quantities of large well-colored flowers. As specimen plants nothing so good has been seen in Boston before. From the same establishment were sent a collection of Cinerarias, which are there made a specialty, although this year the plants were hardly equal in finish to those which Dr. Weld exhibited last year. His bulbs, too, especially Hyacinths, were very fine, as were those exhibited by John L. Gardner and N. T. Kidder. Hard-wooded greenhouse-plants never appear at Boston flower shows in any great variety, unfortunately, for certainly there was nothing more interesting in this show than the Chorozemas, Eriostemons, Boronias and Grevilleas exhibited by Mr. Gardner.

Siebrecht & Wadley, of New Rochelle, exhibited ten varieties of Pitcher-plants, including a new seedling, which received a certificate of merit. Tea Roses were shown in good condition, although none of the collections were exceptionally fine. It is a suggestive fact that Tea, and not hybrid Perpetual Roses, were chiefly exhibited this year in Boston. It is to be hoped that this is an indication that the extravagant habit of forcing hybrid Roses is going out of fashion, and that the more beautiful and delicate Tea Roses are again to take the first place in winter decoration.

The display of Carnations, owing to the great encouragement in the way of prizes given this year to these flowers, was superior to any previous one, the principal contributors being R. L. Lombard and William Nicholson.

Orchids did not make a feature of the exhibition, although small well-grown collections were staged by E. W. Gilmore, of North Easton, John L. Gardner and N. T. Kidder, Mr. E. Butler setting up a remarkably well-grown plant of *Dendrobium nobile*, which took the first prize for a single specimen. The first Theodore Lyman prize for ten Orchids was awarded E. W. Gilmore, and the second to John L. Gardner, Mr. Kidder taking the first of the society's prizes for three Orchids, and Benjamin Gray the second. For stove and greenhouse plants Dr. Weld took the first, and Mr. Gardner the second prize. The first two prizes for six Cinerarias, the first and second for three plants, and the first and second for a single plant went to Dr. Weld, who also captured the first prizes for Cyclamens and Hyacinths and for the best three pots of *Lilium Harrisii*. To Warren Elwell was given the first prize for a general display of spring-flowering bulbs, open to florists only, and to R. L. Lombard the first prize for six varieties of Carnations, the second going to William Nicholson, and the third to H. K. Southworth. Paul Richwagen was awarded the first prize for twelve blooms of any crimson variety of Carnations with Ferdinand Mangold, and Galvin Brothers for twelve blooms of any pink variety with The Princess. The same firm took the first prizes for any scarlet variety with Hector, and for any white variety with Mrs. Fisher, while Golden Triumph, shown by R. L. Lombard, was considered the best yellow, and Waban, the best Tea Rose introduced since 1889.

Periodical Literature.

A good idea of the character and composition of the forests which cover the southern Alleghany Mountains, the richest and most productive forests of deciduous trees in the world, is obtained from a report made by Mr. Jed. Hotchkiss, of Staunton, Virginia, on an investigation of the standing timber of the Guiandot Coal-land Association situated in Wayne, Logan and Lincoln counties, in the south-west corner of West Virginia, and published in a late number of *Science*. The principal timber-trees on about nine thousand acres were counted and measured, and in this way some reliable infor-

mation has been obtained of the present average condition of the forests of this region. The diameter of the trees was taken at about four feet above the ground, and the length of trunks fit to cut into logs or for long timber was estimated by an expert timber-viewer. Trees less than eighteen inches in diameter, with the exception of Hickories and Locusts, which were measured from ten inches upward, were not included in the estimate. To show graphically the results of these measurements, Mr. Hotchkiss selects "a tract of 655 acres on the top of the dividing ridge between the waters of the east and the west forks of Twelve-pole River, two miles north-east of the new mining town of Dunlow, on the Ohio extension of the Norfolk and Western Railroad and about forty miles south-east from the Ohio River." About one-half of the tract lies on the east side of the dividing ridge facing to the north of east, and the other on the west side sloping south of west, the crest of the hill being about one thousand feet above the level of the sea. It was found that 16,989 trees, or an average of twenty-six large timber-trees to the acre, were growing on the 655 acres. Of these 1,986 were White Oaks, 5,886 were Chestnut Oaks, 1,100 were Black Oaks, 736 were Red Oaks, 2,547 were Hickories, 1,900 were Chestnuts, 207 were Locusts, 330 were Maples, 333 Birches, 858 Liriodendrons or Tulip Poplars, 939 were Pines, and 167 were Lindens.

It will be seen that the proportionate percentage of hard woods—that is, of all the trees with the exception of the Lindens, Pines and Liriodendrons—is remarkably large, or about eighty-eight per cent. The record of the diameter and length of each of the trees counted shows that most of them are of large size, the Oaks ranging in diameter from eighteen to sixty inches, and in trunk length from twenty to sixty feet. The Hickories range from ten to twenty-seven inches in diameter, and from fifteen to sixty feet in trunk length; the Pines from eighteen to forty inches in diameter and twenty to seventy feet in trunk length, and the Tulip Poplars from twenty to sixty-six inches in diameter and from thirty to eighty feet in trunk length.

Notes.

Mr. H. E. Chitty, of Paterson, New Jersey, writes to *The American Florist* that 3,840 plants of the Carnation Lizzie McGowan, occupying a bench surface of 1,100 square feet, produced 60,550 prime flowers in 119 days, while 50,000 cuttings were taken from the plants during the last month of the time covered by this record.

The third series of Hooker's *Icones Plantarum*, consisting of ten volumes, with a thousand plates, has recently been completed. This work, in which are figured new plants from all parts of the world, is indispensable to working botanists, and as only two hundred and fifty copies are printed, this series, like the previous ones, must soon become scarce and difficult to obtain. We are glad, therefore, to be able to announce that a few copies are still to be had from the Director of the Royal Gardens at Kew, where the work is prepared with the aid of a fund left by Mr. George Bentham for the purpose. The price of the set of ten volumes is only £5, or twenty-five dollars.

Monsieur Edward André, the distinguished landscape-gardener and the editor of the *Revue Horticole*, has been elected a member of the National Society of Agriculture of France in the section of "cultures speciales" to fill the vacancy caused by the death of the late Monsieur Hardey. Membership in this society, which is connected with the Institute of France, is limited to one hundred, and is regarded the highest honor within reach of French cultivators of the soil. Monsieur André's associates in the section in which he will take his seat are Duchartre, Pasteur, Chatin and Henri de Vilmorin. It is eminently fitting that art in gardening should be represented in this august body; and no man in Europe so well deserves the honor of representing it or can speak with so much authority as Monsieur André.

Professor Halsted writes that he has observed during the past winter that eel-worms (nematodes) have been very destructive among young Ferns. The first leaves of Ferns are very small and delicate, and two or three worms are sufficient to destroy a plant, from which they pass on to the next victim. In one bed of young Ferns noticed the dead plants were separated from the living by a line as distinct as that between the burned and unburned portion of a meadow in early spring. These pests usually attack plants from the root, and probably at the outset have made their entrance into the Ferns from the soil, but they can also spread from leaf to leaf throughout all

the plants in the bed. The soil on which the Fern-spores are to be sown should be subjected to a high heat some time before that operation. This will destroy all nematodes in the soil, and after that lime-water, sulphur and other applications known to be injurious to the worms, but harmless to tender vegetation, should be used.

When flowers are placed near a wall-painting in Japan the greatest care is taken to secure harmony between the two, so that, viewed together, they may form a single agreeable decorative composition. Beside a long painting a low composition will be used, but when the picture is short and broad the flowers may stand high and full. If lake or river scenery is represented in the painting, water plants will usually be chosen for a floral arrangement, forming, as it were, the foreground to the painted landscape. The same kinds of plants, however, must never be repeated, because those in the picture would necessarily suffer by close comparison with their natural prototypes. In front of a painting which represents some flower of the season, a vase of water is often placed in which lie a few fallen blossoms and petals of the same flower, thus continuing the idea of the picture without giving rise to unfortunate comparisons. If a verse of poetry is inscribed on a wall scroll, flowers which illustrate the poem may be set beneath it, but some critics proclaim that this should never be done, as the sight of the natural flower restricts the imagination and may detract from the force of the sentiment expressed by the poetry.

The last number of the *London Garden*, which we have received, speaks of our Newtown Pippin as "an apple of the highest and finest flavor, a delicious combination of the acid and the slightly sweet which leaves no unpleasant reaction. It is an apple, too, which shows the weakness of the ordinary classification of dessert apples and cooking apples, for while it is the most perfect of apples for dessert-eating, it is also a perfect apple when stewed in its own sugar." What is of more interest, however, to American growers is that the demand for it in the London market has led some of our exporters into sending fraudulent barrels containing other kinds of apples and labeled as Newtown Pippins. The writer had seen one of these packages which bore all the external marks of containing the choicest of Newtown Pippins, but the apples, although large and fair, were absolutely devoid of the flavor of the genuine fruit. Such practices as this would soon ruin the reputation of these apples. Since we have a fruit which, when properly grown, excels in delicacy of flavor, the greatest care should be taken to prevent a substitution of any counterfeit, for this will inevitably cause a general suspicion of the stock and break down prices.

We have received a copy of the *Lakes and Summer Resorts in New Hampshire*, which has been issued by the Board of Agriculture of that state. It consists of nearly a hundred pages, with many beautiful pictures of lake and mountain scenery, and gives an authentic list of the summer hotels and boarding-houses of the state, with brief descriptions, names of proprietors, charges, etc. Two years ago efforts were first made by the state to advertise its abandoned farms and natural attractions, and it is said that four hundred and fifty of these vacant farms have since become occupied and the summer boarding business is largely increased. This pamphlet is issued to reply to the numerous letters of inquiry which are received about these subjects. The enterprise of the State Government is certainly to be recommended. Too much cannot be said of the grand mountain scenery and of the six hundred lakes which are scattered over the state. Many large estates and extensive private parks have already been established in New Hampshire, one of the latter containing 21,000 acres. These large estates are multiplying rapidly, and although we can hardly credit the statement of the pamphlet that "the time is fast approaching when New Hampshire will be one grand park," nevertheless it is true that rare opportunities are still offered for those who desire a country home, and especially a summer home.

Dr. C. B. Graves writes in the *Bulletin of the Torrey Botanical Club* for March that he has found in south-eastern Connecticut "a small but flourishing station" of *Phlox maculata*, the Wild Sweet William, which *Gray's Manual* describes as at home from "New Jersey and northern Pennsylvania to Minnesota and south to Florida and Arkansas." Dr. Graves saw the plant in a meadow beside Jordan Brook, in Waterford, about four miles from New London, and says: "So far as observed it is confined to two patches, the larger of which comprises an area of thirty or thirty-five square yards, the smaller less than half as large, lying thirty or forty rods farther down

the brook. The plant grows very thickly in both these patches, and when in bloom fairly illumines the meadow. The interest in this station lies in the question whether the plant is or is not indigenous here. Only a little way from the meadow is a farm-house which has been occupied by the same family for several generations. There is no tradition in this family as to its ever having been introduced, and no one now living remembers a time when it did not grow in its present position. Furthermore, it is not found in any garden in the neighborhood, and, in fact, I have never seen it in cultivation in this vicinity. All these facts point to its being a native. On the other hand must be mentioned its very limited distribution, its occurrence so far north and east of its recorded range, and its nearness to human habitations. If introduced it must have been at some remote time in the past."

Mr. R. A. Rolfe writes that the economy of fertilization in the Swans-neck Orchids (*Cycnoches*) is very interesting, and only from this standpoint can we hope to understand the great diversity between the sexes in the majority of the species. In both the lip is uppermost, and forms a kind of landing-stage on which insects which visit the flowers alight. In all probability it is the insect's abdomen which comes in contact with the tip of the column, as the action can easily be imitated artificially. But in the case of the male flower a very curious mechanism comes into play. The stipes of the pollinium are tightly strained around the rostellum, but as soon as the sensitive filament is touched the pollinium is liberated and ejected from the flower by its own elasticity. During its short flight it not only straightens itself, but curls up into a spiral in the reverse direction, tightly clasping the anther-case, but leaving the viscid disk exposed, and this becomes tightly glued to the body of the insect. The pollen is now wrapped up in the anther-case, but the filament is hygroscopic, and being exposed to the air it soon dries and straightens itself, when the anther-case, having served its purpose, falls away. Meantime the insect will have visited other flowers, and if one of these is a female the pollen would come in contact with the viscid stigma, between its pair of fleshy wings, and thus fertilization is effected. In the early morning these plants exhale a most powerful perfume, which serves to attract the insects. And now we may see the curious way in which the different structure of the male flower of the section *Heteranthoe* comes into play. In the section *Eucycnoches* the lip of the male is ovate, fleshy, and immovable (as in the females of the entire genus), so that it is by the movements of the insect that its body comes into contact with the apex of the column. But in the flowers of section *Heteranthoe* the lip is reduced to a small, round disk with radiating teeth, and instead of being immovable it is attached by a slender hinge, and as soon as the insect alights its weight depresses the hinge, and its body comes in contact with the apex of the column with some force, invariably liberating the pollinium. It is marvelous how perfect all these adaptations are, and it has been a work of the greatest possible interest to me to trace their action and use.

Catalogues Received.

J. B. ALEXANDER, Hartford City, Ind.; Price-list of Fruit Trees, Small Fruits, Ornamental Trees and Shrubs.—ANDORRA NURSERIES, Chestnut Hill, Philadelphia, Pa.; Hardy Trees, Choice Shrubs, Plants, Roses and Fruit.—JOSEPH BRECK & SONS, 51, 52, 53 N. Market St., Boston, Mass.; Novelties and Specialties in Vegetable and Flower Seeds, Bulbs, Roses and other Flowering Plants, Shade, Ornamental and Fruit Trees.—E. F. BROCKWAY, Ainsworth, Iowa; Price-list of Transplanted Evergreen Trees.—A. T. COOK, Hyde Park, Dutchess Co., N. Y.; Vegetable and Flower Seeds.—JOHN W. DOUGLASS, 57 Beekman Street, New York, N. Y.; Illustrated Catalogue of Implements for the Farm.—GRAHAM, EMLEN & PASSMORE, 631 Market Street, Philadelphia, Penn.; The Philadelphia Lawn Mower and Lawn Sweeper.—JOHN LAING & SONS, Forest Hill, London, S. E., Eng.; Special Catalogue of Caladiums.—NATIONAL HOT WATER HEATER CO., Boston, New York, Chicago, San Francisco; The Spence Hot Water Heater for Heating by Hot Water Circulation.—BENJAMIN RIMBAUD, Toulon (Var), France; Special Trade Offer of French Bulbs for Forcing.—SHADY HILL NURSERIES, Cambridge, Mass.; Illustrated Catalogue of Choice Trees, Shrubs, Vines and Plants. Supplement of New and Rare Plants.—C. THURSTON, Paterson, N. J.; Price-list of *Begonia Thurstonii*.—THOMAS S. WARE, Hale Farm Nurseries, Tottenham, London, Eng.; New Catalogue of Hardy and Greenhouse Climbing Plants, Single Roses, Rare Fruits, Culinary Roots, etc. Illustrated Catalogue of *Paeonies*, *Primulas* and Hardy Ferns. New Catalogue of Hardy Florists' Flowers. Illustrated Catalogue of Hardy Perennials.—THOS. W. WEATHERED'S SONS, 244 Canal Street, New York, N. Y.; Hot Water Heaters, for Heating Dwellings, Conservatories, Greenhouses, Graperies, Poultry Houses, etc.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLES:—Public Indifference to Forests.....	157
Early Spring Flowers.....	157
Sabal Palmetto in Europe.....	158
The Story of a Suburban Place.—II.....	<i>Sylvester Baxter.</i> 158
Holiday Notes in Switzerland.—III.....	<i>Geo. Nicholson.</i> 159
Serotinous Pines. (With figure.).....	<i>Geo. B. Sudworth.</i> 160
CULTURAL DEPARTMENT:—Winter Climbers.....	<i>M. Barker.</i> 162
Odontoglossum Rossi.....	<i>John Weathers.</i> 163
Two New Poppies.....	<i>Amy Whitman.</i> 163
Nepenthes.....	<i>W. H. Taplin.</i> 163
"Falling" of Egg-plant Seedlings. (With figure.).....	<i>Professor Byron D. Halsted.</i> 164
CORRESPONDENCE:—Southern Forests and Forest-flowers.....	<i>L. Greenlee.</i> 164
Grafting.—II.....	<i>A. W. Pearson.</i> 165
In the Gardens of Brookline, Massachusetts.....	<i>M. Barker.</i> 165
Wild Flowers in Cultivation.....	<i>Lora S. La Mance.</i> 166
EXHIBITIONS:—The Spring Flower Show at Philadelphia.....	166
RECENT PUBLICATIONS.....	167
NOTES.....	168
ILLUSTRATIONS:—Pinus clausa, Fig. 24.....	161
Seedling Egg-plants destroyed by a Fungus, Fig. 25.....	164

Public Indifference to Forests.

THE greatest difficulty in dealing with large questions of national importance, whether political or economic, is to induce men to take an interest in any subject which does not personally and directly benefit them. Planning for future generations is not an occupation which is attractive to the ordinary mind anywhere. Large issues demand broad intelligence to cope with them and an amount of unselfish zeal which is not the endowment of everybody. The Prometheus of a generation is very apt to find himself chained to a rock, with the vulture of impatience gnawing at his vitals, while he chafes at the mistakes and apathy of his contemporaries, of which his clear vision foresees the consequences.

Public spirit that extends beyond the scope of one's vision, and has no connection with one's pocket or personal pride, is rare. One who pleads for what most people consider a sentimental cause has little chance with the promoter of a railroad scheme which gives immediate employment to many people and temporarily raises the value of land. He finds it easy enough to induce men to abate a nuisance at their own doors, but how many people are there who are capable of understanding the importance of preserving the forests on some mountain-slope in Colorado which they have never seen or even heard of? This anxiety besets him with regard to the blind destruction of forests, which goes on in spite of warning, in the teeth of entreaty, in the face of the proved fact that a more judicious management of our woodlands would result in direct pecuniary advantage even to individuals, while in a broad way it would render incalculable service in promoting the health and prosperity of the entire country. With all the abounding generosity which feeds and clothes and educates the needy, the world is still lacking in that larger benevolence which touches the roots of economic questions, and helps to ward off evils to come. Ready as we Americans

are with our pound of cure, it must be confessed that we, in common with the rest of mankind, are often niggardly enough about our ounce of prevention. The man of science, who sees consequences clearly, stands in the same attitude toward the destroyer of forests as a grown-up person does toward a child who is determined to grasp the flame of a candle, without the same power to prevent the consequences of ignorant rashness.

It is not our purpose here to point out in what way or to what extent a forest-cover on our mountain tops and slopes works beneficently, nor to show what disasters are sure to follow the destruction of such forests. There is much to be learned about these questions, but we know enough to demonstrate the folly of the reckless destruction of our woods. We are not called upon to base our action upon untried theories. Experience, and the most costly experience, too, has amply demonstrated what a nation loses when the wood-cover is stripped from its mountains, and what it costs to restore the wholesome balance of natural forces when this is once disturbed.

It is not knowledge that we lack. We have enough of this to form the basis of wise and successful action in saving and using our forests. The questions which the nation should now be discussing are the practical details of forest-management—that is, we should have proceeded far enough in this work to be studying and experimenting as to the most economical and effective system of forest-management under American conditions. Long ago public opinion should have compelled the laying of the foundations of a proper forest-administration for the lands of the nation and for the control of the forests under the various states. But, as a matter of fact, we have not begun to do anything; we have not begun even to get ready to do anything. To our congresses and legislatures warnings of destruction and depopulation such as have occurred over large territories of the French Alps sound like tales of little meaning. The result is that we still need exhortation by forest-congresses, and bulletins from the half-supported forest-bureau of the Government, and the pleadings of special writers in the newspapers; and all this not for the purpose of instructing the people in the most simple and elementary points of practical forestry, but to awaken them and their legislators to the fact that such a thing as forestry has an existence.

Of course, it is rather discouraging to know that the preliminary work, which ought to have been finished as early as the middle of the present century at least, will still be needed in the beginning of the next century. Other nations have waited for calamities to arouse them to the need of taking some thought for the future, and perhaps nothing less than a series of disasters will suffice to convince us of the necessity of some intelligent forest-policy. And yet such effort cannot be wholly wasted. A few will listen, and now and then one will be convinced, and ever after he will carry about the burden of his responsibility and become a centre of good influence. All this preparatory work will make the ultimate change in public opinion more radical and complete. The day is sure to arrive when we shall look back upon the reckless attacks upon our forests with torch and axe as the work of barbarians. It is literally true that, as a rule, we show no more prudence in our treatment of our forests than is manifested by the savage who, after supplying his present needs and satiating his appetite, lies down under a tree and sleeps with no thought or care for the morrow.

THE flowers of early spring have a peculiar charm. Every year as they open they bring a fresh delight, not only by their rare beauty, but by the appeal they make to the imagination as the pioneers of the great floral procession which is to sweep onward until arrested by another winter. These flowers attract our sympathies, too, by their singular delicacy. Nothing is so fragile as a Snowdrop, and yet its spirit is sturdy enough to brave the ice of February, and the dainty colors and tender grace of all of

these very early flowers are the more impressive because we do not naturally associate such a delicate exterior with the stout-heartedness which is needed to withstand the wild weather of an American March.

Of course, it is too late now to make any preparation for enjoying these flowers this year, but this is the time to make notes of them and to determine that the opening days of next spring shall be brightened by their presence. In this latitude Snowdrops are still doing well, and their vestal white is well set off by the blue of Scillas and Chionodoxas. Then there are Grape Hyacinths, Crocuses, of course, and a few of the *Præcox* Daffodils, the Irises, of which Mr. Gerard wrote so entertainingly last week, the comparatively new but invaluable *Anemone blanda*, Rock Cress, Winter Aconite and many more of rare beauty, which appear while the chill of winter is still in the air and before the coming of the burst of bloom from the great mass of spring flowers. It is well to remember that for very early flowers in our climate bulbous plants are better than fibrous-rooted ones, which, from their structure, are liable to be heaved out of the ground by alternate freezing and thawing.

MONSIEUR NAUDIN, in a personal letter from Antibes, calls our attention to the fact, of which we have long been aware, that Sabal Palmetto, the tree Palm of the south Atlantic states, is not to be found in any of the gardens of southern France, where, he remarks, it ought to be much hardier than many of the Palms which flourish there, as neither sun, the neighborhood of the sea nor the character of the soil is wanting, and then asks, "Can it be possible that the absence of this plant from European gardens is due to the absence of favorable microbes or to the presence of injurious microbes?" Sabal Palmetto is the most boreal of all the arborescent Palms; it must have been introduced into Europe a century or more ago, as Mark Catesby was familiar with it and sent many Carolina plants to England in the last century, as Michaux did forty years later to France. Perhaps some of our correspondents will be able to enlighten us as to whether this Palm is ever cultivated either in the southern states or in Europe where it is represented, so far as we have observed, by a single plant of exceedingly doubtful identity in the Palm-house at Kew.

The Story of a Suburban Place.—II.

THE shaping of the surroundings of the house has been a matter of slow and gradual progress. The work is by no means completed yet, and the contemplation of the opportunities for adding pleasant features is no small source of enjoyment. Nature has done much toward the plan, and the main idea has been to re-enforce and assist her in the creation of an attractive scene. The character of the ledge beside the house, being rough and wild, forbids anything like decorative regularity, and the treatment adopted has therefore kept in view the idea of blending and modulating the ruggedness into an environment of informal domesticity.

The entrance to the place, serving the neighboring house as well, was originally along the easterly boundary of the lot. After a while the hand of municipal improvement was laid upon our lane and its steep and stony ascent was changed into a handsomely curved and well-graded public street. This was welcome, for the lane had been a cause of protest on the part of local hackmen, and in the winter the overflow from a spring farther up the hill had at times converted its gullied slope into a glacier. But, unfortunately, the improved grade had so cut it down that the beginning of our entrance was left so far above the sidewalk as to require an appallingly steep ascent if kept upon the old lines. So the best thing to do appeared to be to buy something over 13,000 feet of the neighboring land and construct a new drive-way, curving up the hill-side.

This drive-way skirts the verge of a thicket of wild wood that occupies the upper portion of the new land. It is a picturesque clump of trees, though promising no luxuriant growth, for the most part, on account of the dryness and rockiness of the hill-side. There are White Oaks and Red Oaks, White Ash, Hornbeam, Red Cedar, Pitch Pine, Wild Cherry and Tame Cherry, the latter evidently sprung from seed sown

by the birds. On the lower side of the drive-way is a Tupelo, something of a rarity in these immediate parts.

The grade of the drive-way is so steep that attempts to keep it in order have been fruitless. Cinders from the furnace have given it a firm surface for a while, but a severe down-pour washes it badly. Nothing but paving would give it anything like permanent orderliness, and as that would be too costly the best thing appears to be to let it alone. It is not much used, except for heavy deliveries, and so it is allowed to take on the appearance of a rural lane, which is not out of keeping. The undergrowth of the woodland thicket largely supplies its borders. The upper slope forms a bank of Barberries, Blueberries and Privet, and the wild Fox Grape—bearing abundantly its clusters of small-berried and big-seeded fruit, of little value except to attract predatory urchins, who fancy that the wildness of the spot gives them license to help themselves—climbers in tropical luxuriance over the trees above. The road-way is fringed with Wild Primrose, Asters, Golden-rod and other spontaneous growths. At one spot a mass of Black-berry-canecanes, with a sort of Bamboo-like grace, has grown as high as eight feet out of the irregular stone embankment on the lower side of the drive-way. These are beautiful at all seasons, and particularly so in the spring, with their wealth of blossoms.

At the turn of the drive-way, a glimpse of the house is caught, with a large Savin as a sort of sentinel outpost at the beginning of the open ground—a picket from a grove of the same trees, which, though on another lot of land, form a kind of adjunct to the place. They are, fortunately, so situated that they will be likely to remain. The Savin, or Red Cedar, like the European Cypress, has a sort of architectural character, with its spire-like form, and often lends itself beautifully to the effect of buildings near by, as in this case.

A recent survey shows a practical approach by a slightly curving drive from the same direction as the original entrance, with a grade even lighter than that of the street. When the new drive-way is constructed the existing one will probably lapse into a foot-path. Where the present drive-way meets the street the latter makes a short curve, forming an excellent corner lot on the more recently purchased land. Here a thicket of Sumachs has sprung up. In constructing the street a fill was made here, and the rich soil from the surface chances to make a considerable bank along the hollow, next the sidewalk. Here a charming wild garden has come into existence. A dense growth of Bouncing Bet has established itself, and above, next the sidewalk, there is a margin of Chicory, which is one of the European plants that has naturalized itself in the country around Boston, bordering the suburban and country roads most profusely. The Chicory in this spot grows luxuriantly and remarkably high in the fertile soil. So all summer long the slope is clothed with a delicate flushing pink, contrasting delightfully with the cloud of azure bloom into which it merges above.

Close beside the house, to the northward, rises the gray ledge of the hill-side, which gives shelter from the cold winds of winter and makes a local climate which, in the inclement season, is several degrees warmer than on the levels where the main street runs. This ledge is a most picturesque feature. Three Cedars stand upon its verge, and on the slope next the house is a mantling growth of Privet, Barberry and Wild Rose entangled with Wild Grape and Virginia Creeper. The Privet and Barberry are beautiful examples of the "escaped" flora that has established itself in this part of the world. They grow in untamed luxuriance, as to the manner born, and are beautiful at all seasons except, in the case of the Privet, for the brief interval in which its blossoms turn rusty. The Privet, happily, offers no temptations with its fruit, but unceasing vigilance has to be exercised in behalf of the Barberries, whose graceful pendulous clusters gleam like rubies all through the winter against the gray surface of the ledge—fringing it above or growing out of its crevices. For, being "wild," wherever it may grow, it is regarded as a legitimate plunder for foraging boys, who take to the woodlands with their bags and baskets for the Barberry harvest. In the code of the populace all wild fruits constitute an "unearned increment," to which the owner of the soil has no rightful title. Usually a few bushes along the ledge pass through the harvest season unspoiled, and, until the yellow blossoms again droop in their exquisite curves late in the spring, the Barberries form an enchanting spectacle under all aspects of the day, the season or the weather, and from all points of view—flashing in the sunlight or illuminating the dullness of an overcast day, vivid against the snow, contrasting against the blue of the sky, or, seen through the vagueness of a fleecy mist, they become gorgeous jewel-clusters as they drip with diamond damp. Last

winter the Barberries were parties to some enchanting effects in the phenomenal ice-storm, and in that damp, soft clinging snow that clung through the calm air of two or three days.

Along the foot of this ledge remained a bank of gravel, which was covered with soil and planted with a carelessly disposed growth of shrubbery—*Symphoricarpos vulgaris*, the Bayberry, Wild Rose, Staghorn and Glossy-leaved Sumach, Elder, Japanese Barberry, Japanese Honeysuckle, and an example or two of other species. Next the path is a border of Periwinkle. One portion of the ledge is faced with a luxuriant growth of the variegated-leaved variety of the Japanese Honeysuckle, whose golden tone contrasts agreeably with the darker foliage around. Over another portion a Japanese Ivy clings, and an English Ivy, which is perfectly hardy on other ledges in the neighborhood, has made a good start. Elsewhere the clinging *Eunoymus radicans* is growing slowly. The whole effect is that of a natural growth that adapts itself admirably to the ruggedness of the ledge. Here and there some spring bulbs—*Scilla*, *Narcissus*, *Jonquil*, etc.—give beauty to the ground before the foliage appears, and, where room has permitted, some hardy perennials, like *Phlox* and *Loose Strife*, brighten the leafage with masses of color in the summer. Sunflowers and Poppies, from seeds thrown carelessly, also spring up in places where opportunity offers.

The space of turf borders the drive-way with a grassy bank, and here the first flowering bulbs of spring-time sprinkle the tender green with their welcome bloom—*Crocus* and *Snowdrops*, followed by *Scilla*. Here, also, a diminutive water-garden has given such satisfaction as to cause a desire for an expansion, as aforesaid. It consists of the two halves of a linseed-oil barrel, burned out and set in the ground, side by side. In one a *Lotus* has flourished superbly, with its great velvety leaves and exquisite blossoms of blushing rose-tipped creamy petals. In the other, for two years, a fragrant white *Water-lily*, the common *Nymphaea odorata*, bloomed profusely for two summers; but, unfortunately, acting on the advice of some one who said he had left a *Water-lily* out in a tub over winter the year before and it had proved perfectly hardy, when spring came it did not make its appearance. This season the place of the *Water-lily* was occupied by the floating plant known as the *water Hyacinth*, which, from a single example, spread so rapidly as soon to crowd the tub. Out of this growth there rose the graceful shape of a *Calla*. With the pure, waxen-white flower of the latter surrounded by a mass of the delicate lilac-colored spikes of the *water Hyacinth*, and the noble foliage and queenly flower of the *Lotus* adjacent, the spectacle was enchanting.

The house is dressed with *Virginia Creeper*, *Japanese Ivy*, *Clematis*, *Wistaria*, *Japanese Honeysuckle*, and a *Bittersweet* from the neighboring woods. With these mingle some climbing annuals, like *Morning Glory* and *Canary-flower*. For a flower-garden there is not, as yet, so much space as one might think, for where there is the most room it would appear incongruous, and the *Apple-trees* shade an otherwise most appropriate place. As these serve to screen prosaic features of the neighborhood, it would hardly do to cut them away. The flowers are therefore, for the most part, confined to the immediate neighborhood of the house. In the shade of the northerly side a bed of tuberous *Begonias* has given much delight with their wealth of large and richly colored flowers of many shades and hues—crimson, scarlet, vermilion, lemon, straw color, cream and white. A most exquisite variety is a delicate yellow, with the tips of its petals flushing into rose.

The steep and dry southerly slope of the premises has not yet been touched. From the house the eye is carried at once into the distance by the broad prospect Bostonwards, and the ground falls away so abruptly that it is overlooked. Here a few utterly neglected *Pear-trees*, pathetic in their awkwardness, persist in pleading for their lives with such abundant annual offerings of their fruit—loyal to the reputation of the surroundings of Boston as the finest *Pear-country* on the continent—that they have been spared. This slope would probably make an excellent vineyard, or perhaps even a vegetable-garden, if one could afford that luxury. One proposition that commends itself is to establish a growth of trees on the lower portion to shut out the main street and the backs of its bordering houses—the sight of which might some day become unpleasant, though not so now—and to carpet the remaining space with flowering shrubs and hardy perennials, which should bloom in succession through the season.

The southerly slope of a neighboring unimproved tract to the westward immediately adjoining is rapidly reverting to wilderness, and if left untouched a few years more will see a flourishing young forest there. May it long remain so.

Boston.

Sylvester Baxter.

Holiday Notes in Switzerland.—III.

FROM Münster, which we had reached when this record was interrupted, we went by diligence to Fiesch, and thence on foot to Brieg, which is 2,224 feet in altitude. As might be expected from the decreasing elevation, few plants belonging strictly to high altitudes were noticed. *Selaginella Helvetica*, a pretty rock-plant in English gardens, was seen on the banks skirting the road near the Bridge of Grenchols, and from the bridge itself, on ledges in the ravine much too far below us to allow of our recognizing the species, we saw huge masses of *Solomon's-seal* (*Polygonatum*). On sunny exposed banks *Dianthus Carthusianorum*, with clustered heads of red flowers, and *D. sylvestris*, with solitary rose-colored flowers, were not uncommon. Both are charming plants, which thrive under cultivation, and are worthy of a place in every rockery. *Lactuca perennis*, a beautiful composite with pale blue flower-heads, grew in company with the two last-named plants. On walls and rocky banks *Sedum reflexum* and *S. album* were noted in great abundance, but neither species was in flower at the time of our passing. On the banks of the Rhone the long compact spikes of *Veronica spicata*, rising from a carpet of gray-green leaves, and clumps of *Prunella grandiflora* attracted attention by their showy blue flowers. The two are excellent garden-plants and easily grown. *Coronilla varia* formed masses of rich green, enlivened by numberless heads of white and lilac pea-shaped blossoms. This is an excellent perennial for dry banks. *Vicia sylvatica*, with lax racemes of whitish flowers lined with violet, is another perennial both pretty and graceful. The *Bladder-senna* (*Colutea arborescens*) was abundant. In Swiss rustic practice its leaves are sometimes substituted for senna as a purgative. *Hippophae rhamnoides* and *Myricaria Germanica* both grew along the Rhone—in some spots out of chinks in huge masses of rock in the bed of the river itself.

From Brieg, a beautifully situated little town and a railway terminus, we took train to Sierre, an interesting town, one of the most famous of the Swiss "grape-cure" stations. The climate here is favorable to convalescents and to sufferers from bronchial affections. Good wines are made in the neighborhood.

At Sierre we left the Rhone Valley and its vineyards and began at once to ascend the Val d'Anniviers above the narrow inaccessible gorge of the Navigenze. Fine forests, principally of Scotch Pine and of Norway Spruce, occur on the steep slopes; on the first-named, the *Mistletoe* (*Viscum album*) grew in abundance at the mouth of the valley. The *Virgin's Bower* (*Clematis Vitalba*) climbed high up the trees among the rocks below the road, and the *Everlasting Pea* (*Lathyrus latifolius*) was also not uncommon. In clearings, some not a dozen yards square, on ground so steep that the manure necessary for the rye and other crops has to be carried in baskets on men's backs, the peasants were busy turning over the soil. Before we had proceeded far up the Val d'Anniviers we came upon some of the "bisses," or irrigation canals, which form so striking a feature in many places in the canton of Valais. As Dr. Christwell says, in his *Flore de la Suisse et ses Origines*, these "bisses" excite the wonder of every one who for the first time visits the Valais. They represent a sum of work and perseverance which gives the highest idea of the energy of the inhabitants. These works cede in nowise—as regards extent—to those of the dykes and innumerable canals of the rice-plantations of Piedmont, and they surpass them much in boldness of execution. The "bisses" often descend from the very foot of the glaciers, for it is only from there that, in the middle of summer, a constant supply of water can be depended on; even in the upper mountain regions the glacial torrents hollow out a bed for themselves in gorges so deep that it is often impossible to get at the water. The wooden troughs are often carried along on wooden or iron supports which the workmen have had to fix into the vertical or overhanging sides of precipices while suspended at the end of a long rope. The commune of Mund, for example, had to procure a rope 1,200 metres in length to enable it to carry out its own irrigation system. Without these wonderful constructions many districts in Valais would be completely burnt up in summer, and a good deal of high ground, now of great value for grazing, would be absolutely useless. In the lower districts, hill-sides, now of considerable value as vineyards, could not be used for any purpose without this constant supply of water. The excessive dryness of the climate of Valais will be understood when it is stated that it is necessary to water the vineyards—in most parts of Europe the Vine suffers from too much water rather than from too little.

Among many handsome plants noticed between Sierre and Vissoye were *Teucrium montanum*, a dwarf-growing spe-

cies with large yellow flowers, which thrives in English rock-gardens; *T. chamædrys*, a taller grower with smaller rose-colored flowers, and *Artemisia vallesiaca*, a very rare and graceful plant, with finely cut ashy gray leaves. *Anemone Hepatica* was easily recognized by its leaves. *Ononis rotundifolia*, a species with large rosy red pea-shaped flowers, and *O. Natrix*, with large yellow flowers, were conspicuous in sunny spots on banks; both are good garden-plants in Britain.

Kew.

Geo. Nicholson.

Serotinous Pines.

OF the thirty-seven species of Pines found within the borders of the United States, a small group are somewhat peculiar in the development and persistence of their cones. As is well known, most Pines mature their cones in about two years—i. e., the incipient cones of one spring become fully developed in the fall of the second year. The period of ripening usually begins about October, and if the weather be dry and warm the cones soon afterward begin to open and the seeds to be liberated. From then on till spring the cone-scales continue to open and close under the alternating influence of warmth and moisture, and with one or two northern species a large quantity of seed is liberated only after the snow has departed and the sun is again sufficiently warm to thoroughly open the cones.

The Pines having their leaves in fascicles of five, a group in which the White Pines naturally fall, are doubtless the least tardy in shedding their seeds, as they are least tenacious in holding their cones; few, if any, seeds or cones survive the shedding process which nature subjects them to during the first winter.

In the group *Tæda*, two and three-leaved Pines, comprising about twenty species, mostly southern and western, it is not uncommon, however, to find cones persisting on the trees for eight to ten years. The most striking examples of this peculiarity are seen in the following species: *Pinus contorta*, *P. Murrayana*, *P. muricata*, *P. tuberculata*, *P. insignis*, *P. Virginiana*, *P. clausa*, *P. rigida*, *P. pungens* and *P. serotina*. Among these species may be specially mentioned *P. clausa*, *P. serotina*, *P. tuberculata* and *P. insignis* as additionally remarkable for retaining their seeds long after the cones are mature.

Michaux was doubtless the first to observe that the Pond Pine (*P. serotina*) of the southern states matures its cones in two years, but does not liberate its seeds till the third or even fourth year. The closely allied Pitch Pine (*P. rigida*) of the north Atlantic region, though producing less commonly serotinous cones, frequently retains its seeds for a considerable time after the cones are mature. Latest, perhaps, among the discoveries of eastern serotinous Pines is the Florida Spruce Pine (*P. clausa*), in which the seeds are retained at least three or four years. The cones of some individuals of this species, an illustration of which is given on page 161, are not without exception in sometimes opening at or soon after maturity (Fig. 24, *c*), while others ordinarily remain closed for a longer period; occasionally cones are found in which the seeds ten years old have apparently not been liberated.

Of the eastern serotinous species the Florida Spruce Pine is moreover most interesting in the persistency with which it retains its cones. They are so strongly attached by a tough woody columella that the growing tissue of the trunk or branch rarely forces the cones off, but in time commonly envelops them, as seen in *h*, Fig. 24. The important stages of persistence following the mature open cone (*c*), to the deeply-imbedded cones (*h*), are successively illustrated in *c*, *f* and *g* of the figure.

It may be of interest here to recall the note published twelve years ago by Dr. Engelmann (*Bot. Gazette*, v., 62, 63) on the vitality of seeds from the serotinous cones of *P. Murrayana*, a Pacific Coast species. The cones were collected in Colorado in 1875, and after being kept in a dry garret for about five years were sent to Professor Sargent to experiment with as to their germinating power. Seed from cones five years old did not germinate. Seeds still older germinated and grew up, as follows: One out of four six-year-old seeds, one out of three seven-year-old, one out of eleven eight-year-old, one out of six nine-year-old. Seeds from cones ten and eleven years old did not germinate, although such seeds were perfectly sweet and apparently sound.

Dr. Engelmann remarks that the above result was not considered satisfactory; his own opinion, however, being that the result was highly satisfactory, showing that seed in cones five to nine years old retained their vitality, while seed from those over nine failed to grow.

These experiments, doubtless, indicate clearly enough that the life of serotinous Pine-seeds may be trebled, if not quad-

rupled, by being kept in the cones, as compared with shelled seed preserved under the same dry and certainly most unfavorable conditions, it being well known that the germinating power of shelled seed rarely endures longer than two or three years, and usually fails for any considerable per cent. of germination even earlier than this. Why the seed from five-year-old cones did not germinate is not clear, for it is not probable that the younger seed should possess the greatest vitality. The whole subject suggests the need of experiment on the length of time which may elapse before these cones open and during which the seeds retain their vitality.

The degree of heat and moisture to which the cones are subjected doubtless has much to do with the question of early or late opening; this in turn being determined by the season. The comparative effects of these elements are illustrated in the behavior of ripe cones of *P. clausa* subjected to different degrees of heat. Cones left out-of-doors during one season have not opened, but those kept in a covered box in a room with temperature ranging from sixty-eight to ninety degrees, Fahrenheit, opened within two months (*c*, Fig. 24), while cones five to seven years old have not opened under either set of conditions. Cones of *P. serotina* have also behaved similarly under the same conditions.

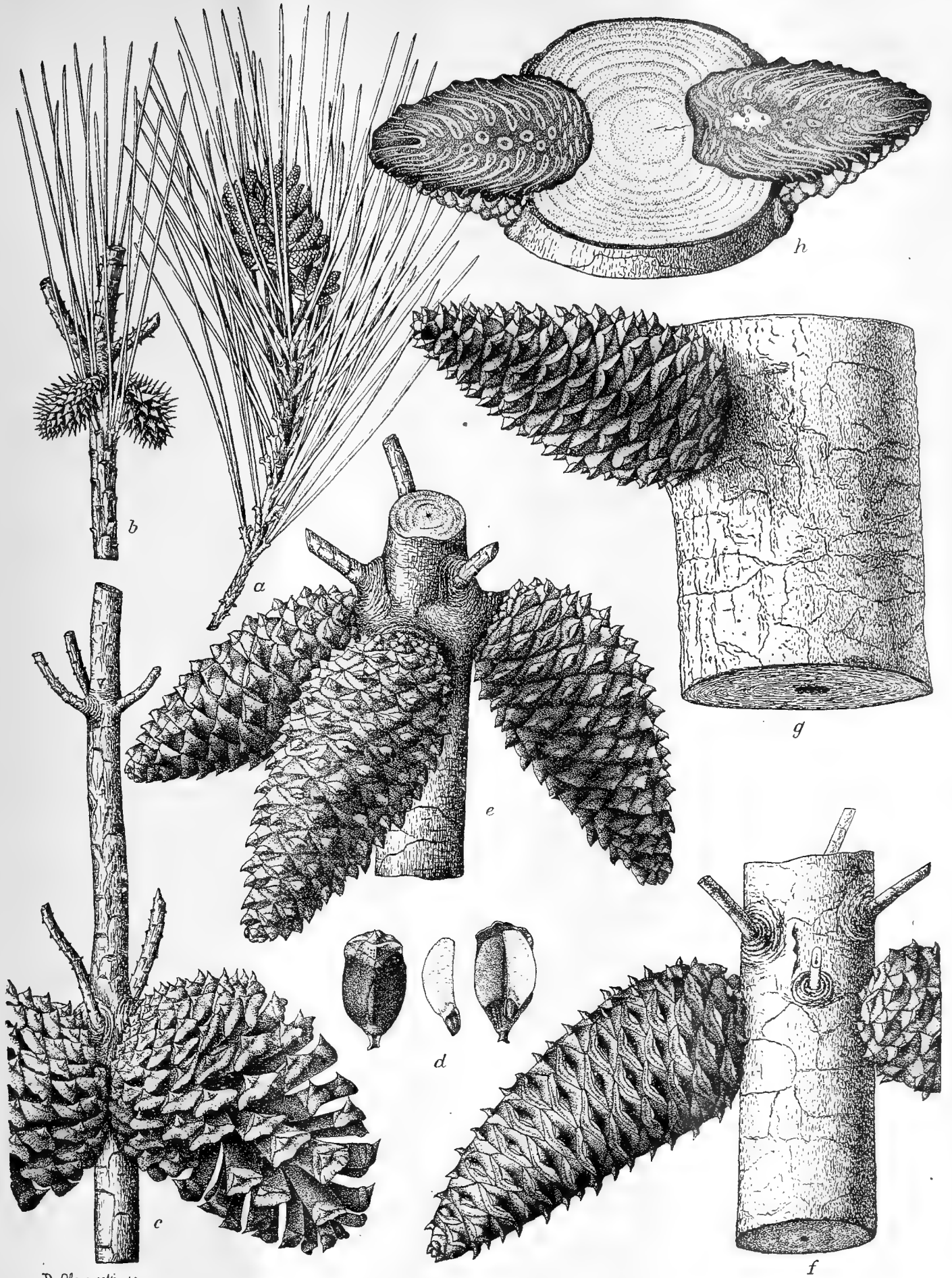
But it is a noticeable fact with almost all serotinous species that a few cones may be found on nearly every individual which open at or soon after maturity, this early opening occurring most frequently on the south and east sides of the crown; occasional opening of this kind may be observed for two to three years after maturity, so that all individuals and species of this class cannot be said to be uniformly serotinous until at least some seeds are shed. The amount of seed liberated at one period of opening is often quite small, the majority of the cones appearing to remain closed.

In seeking for the special economy which nature seems to aim at in imposing upon certain species of Pines the necessity of keeping their seeds over indefinitely, or the mechanical hindrance to shedding them at maturity, it would be interesting to discover how far in reality this peculiar ability or disability is of advantage in perpetuating the species. It would seem quite improbable that for a most perfect germination the seeds should thus be housed for several years before being allowed to escape, as if by retention it were necessary for the seeds to undergo some as yet unknown physiological change, such as that required by certain fungus spores which are unable to germinate until they have passed a winter in the open air. For the seeds of *P. clausa* this is certainly not necessary, as those extracted from mature cones two years old germinated immediately.

There is very little chance of the most persistent serotinous cones reaching the ground, in the ordinary course of events, within eight to ten years, and if they did, they would be likely to open more tardily still; and seed so confined would doubtless become spoiled before the cones were sufficiently decayed to liberate it.

With the exception, perhaps, of *P. serotina*, our serotinous Pines naturally inhabit dry and sometimes nearly arid localities. It may be, therefore, that some advantage accrues to such species in not being able to lose all their seed at once; the actual process of serotinous species being to give up only a few seeds at a time, and thus make the most of their chances to secure conditions favorable for germination. Many other Pines not strictly serotinous, inhabiting similar dry and arid regions, seem to follow the same plan of tardy shedding of seed.

The little-known Florida *Pinus clausa* is geographically somewhat confined in Florida, ranging only from the western border of the state southward along the coast, usually not over thirty miles inland, to the Cedar Keys, where Professor Sargent found it growing quite abundantly. It occurs also on the Atlantic side, south of St. Augustine, here occupying only a narrow ridge of sandy upland as far south as latitude twenty-nine degrees. For the most part it seems to take kindly to the pure sand wastes of the Florida coast, and is here rarely ever more than fifteen to thirty, occasionally forty, feet in height, with a diameter under twelve inches, and branches often coming down quite to the ground. It is not uncommon along these sand-dunes to see numbers of these trees bent over or uprooted by the strong autumnal gales, the yielding sand not affording sufficient support for the roots. On higher ridges and uplands, where the sandy soil is richer from an admixture of clayey marl, it becomes a much larger tree, and is associated with deciduous-leaved trees (Hickories, Oaks and Magnolias), here attaining a height of fifty to seventy feet and over, with a trunk-diameter of more than eighteen inches. In the region of Halifax Bay finely developed specimens of this Pine are still to be



D. Olszewski det

Fig. 24.—Pinus clausa.—See page 160.

a. A branchlet with male flowers. b. A branchlet with young cone, first season. c. Cone two years old, opened by artificial heat. d. A scale and seeds. e, f, g. Persistent closed cone, 4-6 years old. h. Cross-section of a branch surrounding the base of old cones. All natural size.

seen, with trunks thirty to forty feet in length free from branches. These more perfect specimens somewhat resemble *P. glabra*, and among the natives often pass for that tree under the common name of Spruce Pine.

The coarse bark of the trunk is brownish, scaly, and not unlike that of its northern relative, the New Jersey Scrub Pine; but is strikingly different from the latter in the smooth cinereous bark of its upper stem and widely spreading branches. Other important features of this Pine which readily distinguish it from the New Jersey Pine are its longer, persistent, gray, closed cones, and its less rigid and thinner leaves. The cones are also more strongly reflexed than in *P. Virginiana*, while the involucre bracts are ten to eleven in *P. clausa*, and only eight to nine in *P. Virginiana*. The cotyledons of the latter are five to six, as opposed to four (occasionally five) in *P. clausa*.

At the present time the light soft timber of the Florida Spruce Pine has no particular economic value aside from small and very local consumption. The thick, nearly white, sap-wood of the younger trees is often rather coarse-grained, especially in open stands; the heart-wood, commonly less in quantity than the sap, is of a light orange color, and in the larger specimens of rather fine and even grain, resembling that of *P. echinata*. The rare ability of this species to maintain itself with a degree of certainty on the pure sand-wastes of the Florida coasts must doubtless recommend it as a most important element for the future reforestation of these and other adjacent timberless barrens.

A few notes on the synonymy of this Pine may be of interest in this connection, since its botanical name is involved in some misapprehension as to its rightful author.

P. clausa was first discovered at Apalachicola, Florida, by Dr. Chapman in 1846, and twenty-three years later was included in the first edition of his *Flora of the Southern States*, first as *P. clausa*, then as *P. inops*, var. *clausa*, but finally discarded, before the work was published, on the ground that it was only a form of the northern Jersey Pine (*P. inops*). Dr. Gray, however, revived the forgotten species in 1875, when he saw it for the first time in a visit to Florida, later bringing it to the notice of Dr. Engelmann, who studied it carefully, and published his notes in 1877 and 1880.

But the first notice of this species appeared in May, 1876 (*Gardeners' Monthly*, xviii., 151), in a communication by Dr. Vasey entitled "Trees of Southern Florida," a list of Florida woods collected and transmitted by Dr. Chapman to the Department of Agriculture for the approaching Centennial Exhibition. The note is as follows: "*Pinus clausa*, n. sp., at Apalachicola. Dr. Engelmann is doubtful. Perhaps it may be a variety of *P. inops*." Dr. Vasey disclaims the responsibility of naming *P. clausa* in a note preceding this list, in which he says: "I append Dr. Chapman's list of trees obtained (modifying the arrangement)."

Later in the same year Dr. Vasey published the next account of this Pine:

"*Pinus clausa*, Chapman, Florida. A small tree found by Dr. Chapman at Apalachicola, related to *P. inops* (*Cat. For. Trees*, 30; *Rep. Com. Agr.* for 1875, 178. 1876)."

In 1877 (*Bot. Gazette*, ii., 125) and in 1880 (*Trans. St. Louis Acad. Sci.*, iv., 183) Dr. Engelmann gives us the first technical diagnosis of this Pine under "*P. inops*, var. *clausa*."

In his preliminary *Catalogue of Forest Trees* (1830), under *P. inops*, Professor Sargent says of this species: "A variety with serotinous cones (*P. clausa* and *P. inops*, var. *clausa*, Chap.) has been detected in Florida by Dr. Chapman."

In 1883 Dr. Vasey gives the fourth notice of the Spruce Pine under *P. inops*: "In Florida a variety of this species occurs (var. *clausa*), which has narrower leaves and larger cones, and the cones frequently remained closed on the tree for several years (*Am. Journ. For.*, i., 164)."

In the *Catalogue of Forest Trees of North America* (*Reports, Tenth Census*, ix., 75) this Pine is designated as "*Pinus clausa*, Vasey, *Cat. For. Trees*, 30," "*P. inops*, var. *clausa*, Engelmann," being cited as a synonym.

In his supplement to the *Flora* (1887) Dr. Chapman follows Engelmann, giving "*P. inops*, var. *clausa*, Engelm."

The notes here given conclude the main bibliographical ordeal of this Pine since its discovery, and have been reproduced to help clear up the synonymy and substantiate a necessary change in the authorship of *P. clausa*. Regarding this point, it will be seen from the various accounts cited that *clausa* was first properly established by Dr. Engelmann (l. c.), and that in now considering it a species, Professor Sargent, being the first to properly publish it as such, is responsible for the combination *P. clausa*, in virtue of having cited (l. c.), as an equivalent, Engelmann's name, the earliest one accompanied by a diagnosis. This may appear unjust to the original dis-

coverer and those who much earlier published the name *P. clausa*; but the decision is in accordance with the laws of nomenclature and current usage. Employing the double citation the name will become *P. clausa* (Engelm.), Sargent; or *P. clausa*, Sarg., after the De Candollean usage.

It is, moreover, evident that "*P. clausa*, Chapm.," Vasey in *Gard. Month.*, l. c.; *Cat. For. Trees*, l. c.; *Rep. Com. Agr.*, l. c. (1876); "*P. clausa*, and *P. inops*, var. *clausa*, Chapm.," Sargent, *Prelim. Cat. For. Trees*, l. c. (1880), and "*P. clausa*, Vasey," Sarg.; *Tenth Census*, l. c. (1884), can be regarded only as *nomina nuda*, being published with no characters, and accordingly not entitled to recognition.

Forestry Division,
Dept. of Agriculture, Washington, D. C.

Geo. B. Sudworth.

Cultural Department.

Winter Climbers.

SOME of our best greenhouse climbing-plants may, with judicious treatment, be made to flower freely at this period of the year, when they are specially acceptable and useful for clothing walls, columns and rafters. The Allamandas, for example, will continue to grow and blossom as long as water is supplied to their roots, and their gorgeous, rich golden flowers are always pleasing. These plants, however, give best satisfaction when allowed a season of complete rest. Summer and autumn is their proper flowering time; when this is prolonged into winter, the plants should be kept perfectly dry for a few weeks in spring, and pruned moderately close a week or so in advance of starting them, in order to insure a good crop of flowers during the following season. *A. nobilis* and *A. Schottii* are perhaps the best kinds for general use; they require a soil of good substance, plenty of space for their roots, and a stove temperature.

A plant of similarly energetic habit is *Bignonia venusta*, one of the choicest of exotic climbers. It is very floriferous, producing large terminal trusses of vivid orange trumpet-shaped flowers from September to April. Plenty of space should be allotted to the branches, as they flower to greater advantage when given full freedom. Ordinarily good soil will suffice for the roots, and the house should be kept moderately warm in winter.

The Cherokee Rose (*Rosa lævigata*) is in full bloom now, having been pruned in January. It is a glorious mass of dark green leaves and large pure white flowers, with a conspicuous ring of yellow stamens in the centre. The buds are beautiful, and are borne in such profusion that the plant often becomes a sheet of snowy whiteness when they open out. The pity is that they last but two or three days after full development. This plant is a rampant grower, and the wood must be thoroughly ripened before it will flower well. Full exposure to sunshine is therefore essential, as is also an unlimited supply of air during warm weather. Although thoroughly naturalized in the south, it is not hardy in this latitude. *R. lævigata* is well worth a place in a large house, where it can be planted in an inside border. It blooms about April in its native state, but in a house affording an intermediate temperature the flowering period may be regulated easily by pruning. A dressing of decayed manure applied to the soil after pruning is highly beneficial.

Thunbergia laurifolia is a vigorous climbing shrub which was introduced from the Malay Peninsula in 1856. The large, opposite, petiolate leaves are of deep green color and oblong-lanceolate outline. The flowers are three inches in diameter, the limb five-lobed and of pale blue color, the tube wide, pale yellowish inside, and white on the outside. They are borne profusely, during the autumn and winter months, in terminal or axillary racemes or whorls. *T. laurifolia* Harrisii is even more attractive than the type, the flowers being of a deeper shade of blue with throat of orange-yellow, and they appear in still greater numbers. It is a native of Moulmein, whence it was introduced about the same time as the species. Both plants flourish luxuriantly when grown in a house the temperature of which is not allowed to fall below fifty degrees, Fahrenheit. The roots, however, should be confined as to space, or the growth becomes rank and the quantity of flowers is lessened; for the same reason, the soil should be of a medium rather than a rich character. Even with these precautions it is frequently necessary to thin out the thick mass of branches.

Kennedy rubicunda is not so well known as the foregoing, although it is more than a century since it was introduced from Brazil. It is an evergreen twiner, growing and flowering freely in a cool house. The trifoliate leaves are of bright

green color, and the papilionaceous flowers rich red, tinged with black in the lower portions, and borne in axillary clusters. The flowers have an odd, but by no means unattractive appearance, and the plant is easy to grow, thriving in common potting soil. Fitting companions to this, requiring similar treatment, are *Solanum jasminoides*, with its innumerable pendulous clusters of pure white star-shaped flowers, each having a showy bunch of yellow anthers in the centre, and the graceful, thrifty *Tecoma australis*, whose yellowish tubular flowers, with brownish throat, are produced abundantly in large drooping panicles. *Manettia bicolor* must not be forgotten, for its yellow-tipped, bright scarlet flowers have a matchless way of imparting brilliance to dull old walls. The list is far from being exhausted, but a sufficient number have been mentioned to show what can be accomplished in this direction without much trouble.

Cambridge, Mass.

M. Barker.

Odontoglossum Rossii.

WITH the exception of *Odontoglossum crispum* and *O. Pescatorei*, there is, perhaps, no representative of the genus so generally useful as *O. Rossii*. In 1837 the collector Ross introduced this species from Oaxaca, in Mexico, to England, where it was placed in the hot-houses of his patron, Mr. Barker. Usually from three to five flowers are borne on the more or less arching scapes. At a recent show of the Royal Horticultural Society in London a plant was exhibited, on one scape of which, a branched one, as many as fifteen large flowers were fully expanded. The variety, which had been grown in the collection of Mr. Philip Crowley, Waddon House, Croydon, was an exceptionally good one. The sepals were heavily blotched with chocolate-brown on a cream-colored ground, while the petals and lip were of a beautiful soft pink, delicately veined with rose. At the base the petals were, of course, heavily blotched like the sepals, and the clear lemon-colored callus, streaked at the sides with red, gave the whole a soft and charming appearance.

Amateurs about to undertake the culture of a few choice and easily grown Orchids could not do better than include several plants of *O. Rossii*. Fair, healthy pieces may be obtained as low as half a dollar, although exceptionally fine varieties sell much higher. *O. Rossii* usually blooms during the coldest and dullest months of the year, and if proper treatment is given, the flowers will continue in a fresh unspotted condition for a considerable time. The plants thrive best in a light-some position; the best means to secure this is to grow them in small square baskets or pans, which can be easily suspended within a foot or two of the glass by wires. A compost of rough fibrous peat and clean fresh sphagnum, thoroughly drained, is suitable, and the winter temperature at night should not be allowed to sink below fifty degrees, Fahrenheit. Attention to watering is always necessary, larger and more frequent supplies being given when the plants are vigorously growing than when they are taking a rest and ripening off the pseudobulbs formed during the year.

Isleworth, London.

John Weathers.

Two New Poppies.

A VARIETY of Poppy called the Golden Gate, an introduction of last year, will please all who admire the Shirley Poppy, as it is an improvement on that favorite variety in size, general thriftiness, diversity of coloring, and in the length of its blooming-time.

Plants from seed sown May 23d began to bloom in two months, and grew to a height of three feet. The leaves are bright green, thin, gracefully curved and ruffled, and finely, though very irregularly, cut. They are somewhat hairy, and the blossom-stems are more so, being covered with a fine down, which is sometimes of a silky light red. The buds bend over upon the stalk in shepherd's-crook fashion, the loop thus formed measuring about two inches. The blossoms are single, semi-double, and more rarely perfectly double. The single ones, which are perhaps the most attractive, have four semi-circular petals, the outer pair of which sometimes open flat, making a shallow saucer, while the inner ones fold together and stand up like a cup. But this arrangement is variable.

As the larger blossoms opened they were measured, it being so much more satisfactory, as Thoreau somewhere says, to be exact, and not to say that a thing is "large" or "very large." There was a dark rich red one three and one-half inches broad. The flowers of this color were always single or slightly double, and had at the base of each petal a fan-shaped black spot edged with white. There was a bright cherry-red one, of the shade of color seen on some Japanese fans. This had a white mar-

gin, and measured three and one-fourth inches. Then a clear delicate pink, with white edge, of the same size; a double gray and red of two and one-fourth inches. All these colors in great abundance, as well as clear white, rosy lilac, small very double scarlet ones, and, most striking of all the combinations, a single one, of which the outer petals were scarlet, and the inner ones white, flaked with cherry.

All the Poppy-petals had a silky sheen and a beautiful creasing or crimping of their delicate texture, which was truly a delight to the eye. A stray plant coming up at a little distance from the others, and having room to develop, grew in regular bush-form, twenty-two inches high and twenty-one inches broad. When measured it had one blossom, two dry-seed vessels and twenty-seven buds. Its coloring was the reverse of the typical Shirley strain, being creamy white, with pink edges. The stamens are yellow in light-colored Poppies, and black or purplish in the dark red ones. One charm of the single blossom is its curious seed-vessel with the velvet star-like stigma, plum-colored velvet in the dark Poppies, and white in the others. The Golden Gate Poppies are in profuse bloom till the time of hard frosts, though the number has by that time dwindled to four or five fresh ones each day.

The Flag of Truce, also new last year, makes a wonderfully stout growth, a little over three feet in height. It has a ruffled fringed leaf, often ten inches in length, of a thick smooth texture like a cabbage-leaf, which it resembles in color. There is no down about any part of the plant. The bloom is single, white, shaped like a Tulip, a giant Tulip, for it is four inches across. The correspondingly large seed-vessel is white, with a green velvet stigma. The filaments are pure white, with clear yellow stamens, which soon turn brown. The blossom lasts only about six hours, the petals falling off early in the afternoon of the day it opens. One of the great petals was four and one-fourth inches across, and showed strong white veins. It is a curious Poppy, but it must extend the period of its "truce" before it will be thought very valuable as a garden ornament.

West Hartford, Conn.

Amy Whitman.

Nepenthes.

THE East Indian Pitcher-plants form one of the most interesting groups of ornamental-leaved plants now in cultivation, and are deserving of much wider distribution. *Nepenthes* require the conditions of stove foliage plants, a temperature of sixty-five to seventy degrees and a moist atmosphere. With sufficient heat and moisture but little difficulty will be found in their cultivation. The compost best suited to them is composed of rough fibrous peat and sphagnum-moss; a covering of living sphagnum is beneficial, and also improves the appearance. Wooden Orchid-baskets are useful for growing these plants, and display the curious pitchers to good advantage; these are not absolutely essential, and I have seen fine specimens grown in pots or pans; an abundance of drainage material should be supplied to those in pots to prevent their becoming sodden.

Propagation is usually effected by cuttings, or by seeds when they can be procured, but as these plants are dioecious, seeds are not common in the ordinary collection. Quite a large number of species are now known, and the genus has been much enriched by garden hybrids produced both in Europe and in the United States. Many of the first and finest hybrids on this side of the water were originated by the late James Taplin, who crossed several species sixteen or eighteen years ago; several thousands of seedlings were raised therefrom, many of which have since been named and introduced by various firms. It is difficult to select a short list from the many good forms now in cultivation; among those worthy of general cultivation are *N. distillatoria*. This old novelty is of strong and rapid growth, and produces large bright green pitchers; the stalks usually show a curl or half-hitch, and seem to indicate the tendril-like nature of these curious appendages. *N. distillatoria rubra* is an improvement on the type; the pitchers are frequently ten inches long and are suffused with red over nearly their whole surface.

N. Chelsoni was among the earlier hybrids produced in Europe, and originated at Messrs. Veitch's well-known establishment. It is a handsome variety; the pitchers are rather short and broad, averaging from three to four inches in length, light green in ground color, profusely spotted and blotched with dull red. *N. Hookeriana* is also a well-known species of vigorous growth and handsome form; the leaves are broad, dark green and slightly pubescent; the pitchers are formed at the end of long stalks, and are dark green with reddish markings. Like those of the preceding variety, they have two broad wings with ciliated edges down the front of the pitchers.

Hybrids having pitchers of the broad form are largely derived from *N. Hookeriana* or from *N. Rafflesiana*.

N. Rafflesiana is decidedly one of the finest species in the whole genus. It is a strong grower, and produces immense pitchers, which are sometimes ten to twelve inches in length. The pitchers of *N. Rafflesiana* are dark green, with chocolate markings, and they also have two broad wings down the front. Like most of the members of this genus, the pitchers of *N. Rafflesiana* are subject to variations in shape; the most notable usually precedes the period of flowering, when the pitchers become much elongated and have less color than when in their best condition. In order to prevent this deterioration in form it is advisable to cut back the plants occasionally, and thus induce a short-jointed new growth from the bottom.

N. Morganianæ is another remarkably fine hybrid, and was one of those originated in the first lot of hybrids raised in this country. It is of moderate growth, the leaves pale green, with reddish midribs, and the pitchers flask-shaped and almost entirely blood-red when in perfect condition. *N. Sedeni* is also a fine hybrid, and was raised in England a number of years ago. In habit and shape of the pitchers it resembles *N. distillatoria*, but the pitchers of *N. Sedeni* are much marked with brownish crimson. Among the smaller-growing species *N. phyllamphora* may be recommended; it is of free growth, and produces its bright green pitchers in great profusion. *N. rubra* is of somewhat similar habit, but the pitchers are flushed with dull red.

Other fine species and varieties are *N. Dominiana*, *N. ampullaria vittata*, *N. hybrida maculata*, *N. sanguinea*, *N. Rajah* and *N. lanata*. The last three are somewhat rare, and *N. Rajah* is also notable from the fact that its pitchers are the largest of any species in cultivation. In conclusion it should be remembered that the *Nepenthes* grow naturally in swampy ground, and therefore should never be permitted to become very dry, while during bright dry weather in summer frequent and copious syringings will be found beneficial to them.

Holmesburg, Pa.

W. H. Taplin.



Fig. 25.—Seedling Egg-plants destroyed by a Fungus.

"Falling" of Egg-plant Seedlings.

THE growers of Egg-plants are much troubled with what they call "falling," and unless they exercise great care all their plants may die before passing beyond the seed-leaf stage. In a recent visit to several large growers of Egg-plants I observed that the seedling-beds were frequently spotted—that is, had patches usually circular, and varying from a few inches to two feet in diameter, where the seedlings were dead, while all around the border new victims were falling. This indicates that the trouble originates at certain points, and from there spreads in all directions. These seedlings, when carefully removed soon after becoming prostrate and washed of the earth at the roots, show that the stem is nearly eaten away at the

surface of the soil and the root-system is likewise destroyed. Several plants thus killed are shown in the illustration. The picture was secured by first cleaning the seedlings and afterward floating them in water upon a white plate. By means of a vertical camera the photograph was then taken from which the plate has been made.

The cause of this "falling" of the seedlings is a fungus which is quite common to the seed-bed of gardeners, and about which much has been written from year to year. This fungus, a species of *Pythium*, and probably *P. De Baryanum*, infests the soil of the propagating-bed and thrives upon the substances it contains. Like many other kinds of fungi, it attacks its tender victim near the surface of the soil, and quickly destroys the soft tissue, after which the seedling topples over and is gone. The fungus may cause the fallen top to decay rapidly, while other filaments reach out to new victims not far away.

A remedy for this serious pest, it is hoped, may be found during the present experimentation. The strong heat and abundant moisture that are essential to the development of the Egg-plant seed are the appropriate conditions for the growth of the fungus. Some soil-treatment needs to be found that will first destroy all the *Pythium* germs, then by continuing with a fungicide it is hoped that control may be obtained over this enemy. One of the substances now being tested is corrosive sublimate (bichloride of mercury), and the point to be demonstrated is whether this can be profitably employed. The chief objection to this germicide is its poisonous action upon the human system, and must therefore be used with extreme caution.

Ruigers College.

Byron D. Halsted.

Correspondence.

Southern Forests and Forest-flowers.

To the Editor of GARDEN AND FOREST:

Sir,—American wild-flower clubs in different localities are doing some good work, but all the useful, rare and beautiful species cannot be grown in gardens half as successfully and plentifully as nature grows them in their forest-homes. Since for "health and for wealth" to this great American nation forests must be left standing, why not try to preserve them intact—trees, flowers and all? Before cultivation, travel and free mountain-pasturage many beautiful wild flowers are disappearing. Those plants whose medicinal qualities are well known find in the herbalist a serious foe. It is not the land-owner, but a shiftless population, who reap this wild harvest, and send yearly to the great herbarium at Statesville, North Carolina, thousands of pounds of dried herbs and roots. Here among the mountains of western North Carolina, so rich in medicinal herbs, farmers leave their fields half-cultivated and growing up with weeds to gather elsewhere a harvest which is rent free. The large southern land-owner is too careless of his interests. His acres of uncultivated land, full of game of all kinds, fruits and berries, and the finest of timber, are really the common property of a thriftless population. Even rich beds of surface mineral they plunder lawlessly, and should they be forbidden free pillage by the owner they revenge themselves by damaging him in every way possible. This may sound like a sensational tale, but it is true. The slack system which prevails here is ruinous to the whole population, and nature is robbed unsparingly of her wealth and beauty.

Two yearly forest-fires are set, "by accident," or "nobody knows how"—one in autumn, that these semi-civilized creatures may more easily gather the nut-crop hidden beneath fallen leaves; and one in spring, that their flocks may have better pasturage. Both are disastrous to fauna and flora and fencing for a forest-fire is not easily controlled. There are protective laws for some wild plants—Ginseng, for instance. Once our mountains were full of this valuable plant, but every year it is becoming scarcer, and all because collectors will gather it before the seeds are fully matured, notwithstanding the law in this state prohibiting the collection of Ginseng before September. The roots sell at \$3.25 per pound in Statesville, North Carolina, and hundreds of pounds are shipped there by local dealers from this section, but not a dollar of it goes into the land-owner's pocket, nor can he, without keeping a strict watch upon his hundreds of forest-acres, save the plant from extinction. To prevent this it is now being successfully cultivated in the edges of forests partially cleared.

Another medicinal plant of rare beauty is the Gentician (*Gentiana crinita*). Its root is a powerful bitter tonic, a recognized cure for headache and dyspepsia, and often used as a substitute for quinine; therefore it brings a good price and is in great de-

mand by herb-dealers. The name is such a familiar one that the plant is commonly supposed to be plentiful in woods and meadows, but such is not the case in this region. I remember that when a child I used to think the Fringed Gentian only a fabulous flower, and now it is quite a find in our woodlands, but it is of such rare beauty, so distinct in the depth of its blue, that it is the object of constant pursuit.

The closed Gentian—*G. Andrewsii*—are much more common than *G. crinita*. The flowers are thickly clustered at the tops of the stems, pink or blue in color, and always closed. Found usually in damp, open woods along streams they are quite pretty. A beautiful second to *G. crinita* is *G. puberula*. Its indigo-blue flowers, nearly the shape and size of a Canterbury-bell, are borne in a cluster at the top of the plant, and last a month or more during September or October. Three members of the Gentian family are catalogued by florists. *G. quinqueflora*, or the five-flowered Gentian, sometimes called Gall-weed from the exceeding bitterness of its juices, has slender, branching stems two or three feet high, with rather small, pale blue or light purple flowers. *G. cristata* is much like *G. crinita*, with the exception of being larger. The flowers are bright blue in color, and beautifully fringed, nearly two inches long, opening only in sunshine. It is found wild on wet swampy lands, and makes a good edging for artificial lakes and ponds. *G. serrata* is the Smaller Fringed Gentian, having smaller flowers and narrower leaves than the two already mentioned; these leaves turn bright crimson with the breath of autumn.

These species, though safe from extinction, will doubtless be dwarfed and doubled and crossed and recrossed till little of their original beauty remains. Under cultivation, Gentians like a light rich soil, partial shade, and free circulation of air. The biennial varieties are increased by dividing their roots, and the annual ones by seeds, which should be sown as soon as ripe in autumn. Nearly all the Gentians are blue in color, and flower in September or October.

Even if the wild-flower club should succeed in gathering and cultivating all valuable wild plants, how bare our forests would be without them! The Gentian and Ginseng families are only two out of many which appeal to us. Every land-owner ought so to regulate his little kingdom that it may yearly increase in beauty and value. We need more laws protecting plants and forests, else the deserted farms of New England will be duplicated in many now fertile regions of the south.

Garden City, N. C.

L. Greenlee.

Grafting.—II.

To the Editor of GARDEN AND FOREST:

Sir,—No doubt, top-grafting devitalizes a tree or ruins the limb operated on when the work is improperly done. Sometimes a limb two inches in diameter, or even more, is sawed off; a cleft is made in it; two grafts are inserted opposite to each other, and the wound is carelessly plastered with softened grafting-wax. Such attempts are likely to fail for various reasons. In the stump of a limb of the diameter above named there should be at least four grafts placed, at opposite extremities of two clefts made at right angles to each other. The object in placing so many grafts is to maintain sap circulation on all sides of the amputated limb. Thus, for example, if in a limb two inches in diameter a graft be set in one side only the side opposite the graft will be very certain to die, the wood will then decay, and that piece of grafting (even if the one graft grows) will ultimately prove a failure. Hence, in grafting stumps of such diameter the work after being done should be in a few days inspected, and if any of the grafts show sign of failure others should be at once put in their places. In a year or two the surplus grafts may be cut out, and the wound will gradually and completely heal if life is retained all through the limb which was treated. In limbs of larger diameter than two inches it is safest to "crown-graft," which method permits the setting of as many grafts as may be needed to maintain circulation.

To show some horticultural friends that it could be done successfully, I some years ago sawed off the trunk of a Sheldon Pear-tree below its branches, where its diameter was four and a half inches. Around its circumference I set sixteen crown-grafts. This tree will make a new head, and will bear a good many pears this year. This is an extreme case, and was done more for experiment than with a view to useful results. Another tree in my Pear-orchard, a Lawrence, was attacked years ago by fire-blight. I sawed it off at the ground (the stump there being six inches diameter) and crown-grafted the stump. Two of the grafts I have left growing, and they

are now twelve feet in height, and last year bore a full crop of Kieffer pears. In a year or two I shall remove one of these grafts, probably regrafting its stump, simply to maintain circulation, and ultimately there will be an entire new head on a root twenty years planted.

The most important point in the surgery of top-grafting is the waxing of the wounds made in stock and graft. Every "solution of continuity," as the surgeons express it, should be sealed tightly. This may be most surely effected by using liquid wax, made of resin, linseed-oil and beeswax, tempered so as to be when cold solid, but yet elastic, not flinty, and for use warmed until liquid in a portable furnace and applied to all the cut parts of stock and graft with a small paint-brush. Then all the grafting-work should be gone over, and, next day, where needed the joints should be rewaxed. I have never yet done my work so thoroughly that I found no faults to remedy afterward.

Vineland, N. J.

A. W. Pearson.

In the Gardens of Brookline, Massachusetts.

To the Editor of GARDEN AND FOREST:

Sir,—The greenhouses in this locality are always interesting, and the noble Palm-house of Mr. Joseph H. White is in itself well worth a visit at any time of the year. There are many Palms and Tree Ferns of magnificent proportions at this place, and the healthy appearance of the plants shows rare skill in their management. Two gigantic specimens of *Monstera deliciosa* cover a large portion of the walls of this house with their rich green and boldly effective foliage, and it has been necessary to "top" and otherwise prune a handsome plant of *Araucaria excelsa*, as it had become too large for the lofty edifice. This operation was performed two years ago, and the number and vigor of the lateral shoots prove that the tree has not seriously suffered from it. A fine display of bloom was found in the Rose-house, and the gardener, Mr. Wheeler, speaks with enthusiasm of the Waban, of which he grows many plants. Worth special mention among the plants in the other houses were Carnations, Easter Lilies, *Spiræas* and *Cytisus*, large quantities of which are grown for cut flowers. Several large bushes of the *Laurestinus* (*Viburnum Tinus*) are grown for the same purpose, as the flowers are found extremely useful in the spring. The Peach-trees and Grapevines, in the cultivation of which under glass Mr. Wheeler is quite a specialist, are now in prime order.

At Mr. John L. Gardiner's, where Mr. Atkinson presides, there is a rich assortment of useful plants. *Bignonia venusta*, rambling freely about the roof of a large house, is a brilliant mass of orange-colored flowers. A small plant of *Kennedyia monophylla*, loosely trained to stakes, bore enormous quantities of its pretty little blue blossoms, and a tall specimen of *Ardisia crenulata*, with its profusion of bright scarlet berries and deep green foliage, showed the remarkable utility of this much-neglected plant. Mr. Atkinson assured me it had been quite as good ever since Christmas, and its beauty shows no sign of waning. Great numbers of spring-flowering bulbous plants are grown here in pots, including, besides ordinary kinds, many odd varieties of *Narcissus*, and they are exceptionally well grown. *Veltheimia viridifolia*, a rather uncommon Cape bulbous-rooted plant, with bright green leaves and densely flowered erect scapes, the flowers being tubular and of a pale rose-color, is well represented. Two pans of the double white *Primula Sinensis* formed charming pictures, the pale green of the leaves contrasting well with the flowers. This is a most useful plant, and it is all too scarce in the gardens of the United States. The market-gardeners of London grow it by the thousand, and it always commands a ready sale. The flowers last much longer than those of the single varieties, and they are most useful for cutting. The exquisite odor of its neat little chocolate-colored flowers betrayed the presence of *Boronia megastigma* in nearly every house. Mr. Atkinson finds young specimens of this plant from two to three years old the most serviceable. It is propagated from cuttings, and during the summer months, if planted in the open garden, it makes vigorous growth, which insures abundant bloom, before it is taken up for potting early in autumn. The odor from a single healthy flowering specimen in a six-inch pot will scent a large room or greenhouse. Many more old-fashioned garden-plants are to be found in the collection here, and they have a great charm as old acquaintances when seen as a gardener of long experience knows how to grow them.

Orchids are an important feature, too, and many excellent specimens are seen. The *Calanthes* have passed their flowering stage, but the well-developed pseudo-bulbs are sufficient evidence of what the blooms had been a few weeks earlier.

The best plant of *C. Veitchii* produced a spike which bore forty-seven flowers, and the others were proportionately good. Many grand plants of the stately *Phajus grandifolius* are in full bloom, and one of *Cattleya Trianae* can hardly be excelled. The numerous plants of *Laelia harpophylla*, with their bright orange-scarlet flowers, have a cheerful effect amid the prevailing green, while the fragrant drooping racemes of *Dendrochilum glumaceum* and *D. Cobbianum* give a final touch of grace and elegance to the scene.

Cinerarias and Cyclamens are the principal attractions at Dr. C. G. Weld's place, one large house being filled to overflowing with splendid specimens of these plants. The seeds of Cineraria were obtained from plants of Raymond's California strain. The flowers are of good size, and rich in variety and shade of color. There are some handsome double varieties among them, which may possess decided merit for cutting purposes, but they are not nearly as attractive as the single kinds. To obtain these fine plants the gardener, Mr. Kenneth Finlayson, sows the seeds early in summer, keeping the plants as cool as possible and shaded throughout the hottest months. A mixture of rich loam and leaf-mold, in equal parts, with a moderate addition of sand, is used for potting when the plants are young, and as they require larger pots the compost is gradually made stronger and richer by adding old cow-manure and more loam. Liquid-manure is given once or twice a week when the final pots are filled with roots. Several of Dr. Weld's houses are devoted to Roses, and there is one full of Carnations in pots. Among the latter, Annie Webb, Florence, Lizzie McGowan and Silver Spray were considered reliable. The bareness of the bench-walls in the Rose-houses was relieved by large hanging tufts of *Abutilon vexillarium*, and numerous pots of *Oxalis lutea*, full of its large canary-yellow flowers, hung from the roof. The clear scarlet flowers of *Anemone fulgens* are very showy and conspicuous, and the plants are blooming freely and seemed to thrive well in pans of moderate depth. *Iberis sempervirens* is a perfectly hardy plant, but it is used here for forcing in pots. The specimens are dwarf and compact, and covered with the pure white flowers. A recently imported piece of the famous *Cattleya labiata* bears a single flower, large, beautiful and fragrant, with sepals and petals soft purple, lip white with conspicuous markings of deep purple. *Trichopilia laxa* is also in bloom, and is interesting on account of its comparative rarity. The racemes are of drooping habit, the flowers odorous and pure white, the broad lip yellow at the base.

Cambridge, Mass.

M. Barker.

Wild Flowers in Cultivation.

To the Editor of GARDEN AND FOREST:

Sir,—Every student of nature must have observed the changes made in our native plants by domestication. A simple change in environment is sometimes sufficient to make a radical change in the habits of growth and flowering of such plants. One of the showiest wild flowers of southern Missouri is *Verbena Aubletia*. In its wild state it commences to bloom very early in the spring, and for nearly two months is a mass of reddish purple blossoms, so bright as to catch the eye at a long distance. After the regular spring flowering is over, however, one rarely sees a wild plant in flower, and at the most but a few spikes at a time. Wild plants transplanted to the home grounds immediately make an astonishing growth, each plant reaching two or three times the size of its wild companions, and remaining constantly in flower from early spring until October. In ten years' experience with them I have found this an invariable rule. I give my plants no cultivation further than to plant in mellow soil and to keep free from weeds. The flowers in size and color remain true to the type, the change being solely in increased luxuriance and continuity of bloom. Can any one suggest the reason for this change of blooming period or how it is brought about?

Even more striking is the change in *Viola pedata*, the beautiful Bird's-foot Violet, whose natural time and duration of blooming is about the same as that of *Verbena Aubletia*. I have transplanted Bird's-foot Violets by the hundred, giving them such after-culture as I give ordinary flowers. The blossoms of cultivated plants are no larger than those on wild plants, perhaps not quite as large, but during their regular blooming period they are borne in remarkable abundance, and give irregular but less profuse crops the whole season thereafter. My last summer's garden notes show that there was not a day between the middle of April and first of November when I could not find plants of this Violet in bloom.

In one bed I have several plants of the rarer *Viola pedata* bicolor, the three lower petals of which are a satiny blue, while

the two upper ones seem stamped out of royal purple velvet. This spring half a dozen plants gave blossoms whose lower petals were dotted, splashed or striped with the purple of the upper petals. Sometimes the variegation was slight, but every bloom throughout the season showed it. The season before a bed of choice Pansies grew near the Violets. Was this a case of accidental hybridizing? It seems almost incredible that cultivation alone should cause such sporting, for the wild ones are always true to type.

Pineville, Mo.

Lora S. La Mance.

Exhibitions.

The Spring Flower Show at Philadelphia.

THE exhibition of the Pennsylvania Horticultural Society last week was more successful in point of attendance than any spring flower-show in Philadelphia for many years. There was no staging in the large hall and all the plants were tastefully grouped on the floor, giving the general effect of a well-arranged garden. The great private collections in the city and its neighborhood, as usual, contributed liberally from their treasures, and the show was rich with choice specimens from the greenhouses of Miss Baldwin, Mr. Drexel and Mr. Childs. Two plants from Mr. Childs' collection, well known for their size and beauty, a superb *Livistonia* and a *Cibotium regale*, of truly regal proportions and expression, were seen for the last time here, as they have been contributed by Mr. Childs to the Horticultural Department of the Chicago Exposition.

A group of Palms and other decorative plants from Mr. Drexel was remarkable for high average value of its individual specimens and their admirable condition. Mr. Thomas Long, the gardener who cares for these select specimens, received the first premium for a new and rare plant with a variety of *Araucaria excelsa glauca*, which was quite distinct from the type in its larger and broader leaves and more robust habit. The group of twelve Ferns, also sent by Mr. Drexel, it would be difficult to match for size and perfection of form. It contained *Davallias*, *Gleichenias*, *Cibotiums*, the variety *Major* of *Pteris serrulata cristata*, the crested *Microlepia hirta*, *Nephrolepis davallioides*, and an exceptionally good plant of *Adiantum Williamsi*. Wm. Joyce, gardener to Miss Baldwin, also received prizes for Palms and decorative plants which added much to the general effect of the exhibition. John M. Hughes, gardener to Mr. Childs, received special premiums for the same classes of plants. The Girard College gardens seemed to be the most liberal contributor. Palms, Tree Ferns, Crotons, *Dracænas*, with *Azaleas*, *Cytisus*, *Deutzias* and other hardy shrubs forced into bloom, Pitcher plants and spring flowers in variety were banked against the stage most effectively, and Mr. George Huster, superintendent of these gardens, well deserved the silver medal awarded to him for taste in arrangement as well as the special premium for his plants.

As this was a spring show, the lack of bulbous plants in flower was noticeable. Of Bermuda Lilies, usually so abundant, there were very few; of *Lilium longiflorum* none. All the Tulips, Hyacinths and Narcissi would have been lost in a collection of ordinary size, and of the rarer Daffodils in which amateurs take such a lively interest, only a few of the varieties were represented. This was unfortunate, for certainly this class of plants is worth growing and showing, and a spring flower show is the place where they ought to be seen.

In the foyer the Carnations attracted most attention, the point of special interest being the competition for the Craig Cup for the best twelve blooms of a variety not disseminated. Among the leading competitors for this was E. G. Hill, of Richmond, Indiana, with *Edna Craig*, a very light pink, now the most fashionable color. The flower is very large, with a stiff stem, a perfect form, and a calyx which never splits. Edwin Lonsdale, in the same class, showed *Grace Battles*, a pink flower of a shade deeper than that of *Edna Craig*, and a first-class flower in every way. J. W. Colflesh exhibited another pink flower, Mrs. Colflesh, still deeper in color than *Grace Battles*—that is, about the color of *Grace Wilder* at its best. These flowers are larger and bolder than *Grace Wilder*, and shown on stems eighteen inches long they were very striking. Sentinel was called a crimson-scarlet, which means that it is about the same color as *Hector*, with a good stem and calyx. These four varieties were most notable as showing in a marked way the recent advance in Carnations. There is still room for a new dark crimson which will be as great an improvement on *King of Crimsons* as the new pink kinds are beyond the old ones. A good yellow is still needed. *Golden Gate* bursts badly; sometimes into utter raggedness. Of the better-known varieties, Lizzie McGowan showed very well even alongside

of some admirable Lamborns. Wm. F. Dreer, a rosy pink, one of last year's novelties, showed especially well under gas-light. It is of perfect form and a first-rate variety. The cup was won by Mr. Hill, and special mention was made of Mr. Colflesh's entry. Premiums for cut Carnations were awarded to C. J. Pennock, H. E. Chitty, Wm. Swayne, John Crawford, Joseph Heacock, J. J. Styer and Pennock Brothers.

The display of Orchids was not large, but it was good, and Edwin Lonsdale received the first prize for twenty-five well-grown varieties in bloom with good healthy leaves, and showing admirable culture. Messrs. Siebrecht & Wadley also had a good exhibition. Messrs. Pitcher & Manda had something like two hundred small vases containing cut Orchid-flowers of the most beautiful varieties. They were arranged on staging built in a circular form around an immense Kentia from Miss Baldwin's collection. Among the flowers were those of *Cypripedium Amesianum*, *C. luridum*, *C. Shroederæ*, *C. pavoninum inversum*, the variety *Josephine* of *Odontoglossum crispum*, *O. triumphans aureum*, *O. sceptrum*, and the white forms of *Lycaste Skinneri* and *Cattleya Trianae*. Besides the Orchids, this group contained many of the new and rare varieties of *Anthurium*. Cut Roses, both Teas and hybrids, were exhibited in quantity, and blooms of Baroness Rothschild, Ulrich Brunner, Catherine Mermet, La France and Madame De Watteville were especially good. Bridesmaid, the new sport from Catherine Mermet, appeared in very good form. It is a darker pink than the type, but not so dark as Waban, and the growers consider it a variety of much promise. Other prominent features were the Azaleas of James Dean, W. K. Harris and David Emory, gardener to Charles Dissel; the French Cannas, for which Mr. H. A. Dreer received a certificate of merit, and Mr. Blanc's Cacti, of which there were probably two hundred on the stage, many of them showing beautiful or grotesque flowers. On the last afternoon of the exhibition visitors were presented with small Cactus-plants from Mr. Blanc, all neatly packed and ready for planting.

The special prizes offered for twenty-four specimens of Mushrooms brought out a strong competition in this class. The first prize was won by David Allen, of Boston, and the second by N. P. McCaffery, of Moorestown, New Jersey.

Recent Publications.

Nature in Ornament. By Lewis F. Day. With 123 Plates and 192 Illustrations in the Text. London, B. T. Batsford; New York, Charles Scribner's Sons. 1892.

Mr. Day's seems to us the best book yet published on this interesting subject, and its usefulness will be increased by the fact that it is small and not expensive. It is equally valuable as an historical account of the aims and methods of those who have in the past designed ornamentation based upon natural forms, and as a guide to those engaged in the same work to-day. It will be found interesting by mere lovers of art, and instructive to all designers, from those whose work is architecture to those who spend their leisure hours embroidering. If original designing is contemplated, Mr. Day's words and illustrations will put the student upon the right road. And if patterns to copy are desired, he offers a very rich and varied treasury. The scale of his pictures is so small that it may not often be found possible to trace them off for repetition. But they are strongly drawn and clearly printed, and they can easily be copied by persons who have had any practice in free-hand drawing or in mechanical processes of enlargement.

As the table of contents shows, Mr. Day speaks first of "Ornament in Nature," and then of "Nature in Ornament"; then of the simplification of natural forms and of their elaboration; of "Consistency in the Modification of Nature," of "Parallel Renderings," of "Tradition in Design," of "Treatment" (from the more technical point of view), of "Animals in Ornament" and the "Element of the Grotesque," of "Still Life in Ornament," and, finally, of "Symbolic Ornament." There are few sentences in any of his chapters which are not explained by reference to some pattern which he reproduces; and his reproductions have been drawn from every kind of work, from architectural carvings to silken fabrics and Oriental carpets, and include, moreover, many simple renderings of natural vegetable forms, which greatly enhance the significance of the conventionalized forms that have been derived from them.

It is hard to pick out any chapters for especial commendation where all are good, and, of course, the value of one largely depends upon its relation to the others. But the chapters on "Parallel Renderings" will perhaps be found the most interesting by the average reader. Here Mr. Day says, that

while the "partiality of each particular period and country for a certain few, usually symbolic types, makes it impossible to trace any one single natural form through all history," yet most forms can be traced "through a variety of historical developments," and that "the type of most universal occurrence is probably the Vine, a symbol of philosophies as wide apart as the poles." And then, beginning with the bas-reliefs of Nineveh, he describes and illustrates the ornamental treatment of the Vine among men of every race and in products of every artistic kind, following up this account with briefer but equally interesting ones explaining the artistic history of the Rose, the Pink, the Poppy, and so on. Moreover, at the beginning of this chapter we find so excellent a summary of what the student's attitude toward Nature should be that we cannot refrain from quoting it somewhat at length:

"The study of ornament should proceed, I think, *pari passu* with the study of vegetable forms—not botany necessarily. The scientific study of botany is quite a thing apart. The ornamentist has no more occasion for exact scientific knowledge than the painter has to know surgically about anatomy. We want, in either case, just science enough to enable us to see the surface of things. The classification of a plant according to its hidden organs is as nothing to us compared with its character, its beauty, the hint in it of ornament. An artist can do with comparatively little science if only he make full use of his eyes. Suppose the student in ornamental design to have begun by being well grounded in practical geometry; soon he might proceed to put together, somewhat on the kindergarten system, geometric patterns. . . . Then, as he grew beyond this elementary stage, he might exercise himself in drawing freer and more flowing forms, say, until he acquired the facility in sketching off (with the brush) ornament of the kind the Greek pot-painters drew with such freedom. Simultaneously with this he should be making intelligent studies of leaves, flowers, fruits, and all manner of details of plant-form and plant-growth. With equal diligence he should be studying the masterpieces of applied design, especially noting the way the masters treated those same natural forms, and always choosing his model, whether of plant-form or of ornament, for the definite reason that it meant something to him. His studies should be carried just so far as their purpose warranted; there should be no attempt to make pictures of them, or show-drawings, or to make them even presentable. What the student has to do is to make notes serviceable to himself, sufficient in every case to impress upon his memory what the original conveyed to him, records of what he wanted to record. The urgent need of choosing each example needs the more to be insisted upon, because the designer cannot too early begin to cultivate the selective faculty. Judgment is one-half the battle in decoration. The closer the relation between a man's studies from nature and his studies from old work the better. Take, for instance, any flower you like and study it from nature carefully—its form, its structure, its growth, its color, its character; then see how it is rendered in Classic art, in Gothic, in Renaissance, in Japanese, in Persian, and so on. Observe, again, its treatment in sculpture, in inlay, in metal-work, in textile fabrics, and what not. A series of such exercises, conscientiously and thoroughly done, would be an education in itself, and would in some degree fit one to conventionalize on his own account."

The extract is significant as revealing the broad-minded spirit in which the book is written. Many previous writers on the subject have been, either too strongly archæological or naturalistic in their sympathies; but Mr. Day recognizes with equal sympathy the rôle of nature and the rôle of ancient art as teachers. Nor has he any unfortunate prejudice for or against any special phases of art; everything that is good appeals to him, while he can see mistakes even in the work of the most famous of the ancients. He excludes no kind of good work, and, on the other hand, he sets up no fetishes. Much as he loves nature, he carefully explains how natural forms must be altered for purposes of decoration; and much as he loves art, he cannot praise even very attractive work if it sins against fundamental natural truths.

As this is not a journal devoted to the arts of design, except as the landscape-gardener is concerned with them, we should not give so much space to Mr. Day's excellent book but for the fact that there is an obverse side to its usefulness. If it can teach the artist how to appreciate and use nature, it can also teach the lover of nature how to criticise and appreciate ornamental art; and such knowledge, if widely spread, will advance the cause of art as greatly as improvement in the artist himself.

Moreover, the perusal of Mr. Day's book will profit lovers of nature simply by increasing their appreciation for natural forms themselves. Every one knows how vastly his interest

and pleasure in a particular kind of natural scenery is augmented if he is familiar with the work of some great landscape-painter who has interpreted that special kind. We do not now refer to the actual portraiture of special scenes and sites, but simply to that preference for one kind of landscape-beauty which most landscape-painters exhibit. It does not matter whether or no we ever look upon the actual scenes that Corot portrayed, or even whether he ever exactly portrayed any given spot. He illustrated and poetized a special type of landscape, and when we see this type in France, or even along our American stream-courses, we understand it better because we have seen it upon his canvas; and especially if the hour is morning and the time is spring—the hour and the time when Corot best loved to paint. It is the same with Rousseau and the great masses of brown-red foliage which he loved to depict, and with Diaz and his dusky green woodland glades; and the same with Ruysdael and the wide gray sandy stretches of Holland, and with Cuypp and his fertile valleys, herds of placid cattle and golden sunlight. And as it is with these painters of landscape, so it is with the designers of ornament. If we know their work, we see more in the natural forms they adapted than we ever did before, and appreciate them more thoroughly. Mr. Day's book, therefore, should recommend itself strongly to the readers of GARDEN AND FOREST, even though they may have no practical personal concern with the art it explains.

Notes.

The last line of the article on Chrysanthemum Blight, which appeared in our last issue (page 153), should read "one gill" instead of "one pint." Professor Beach writes that his attention was directed to the error by Mr. John N. May, of Summit, New Jersey. The correction is important, since a solution as strong as that originally given would probably injure the plants.

We have received from Rea Brothers, Norwood, Massachusetts, flowers of *Primula Sieboldi* and half a dozen varieties sufficiently distinct to be worthy of separate names. These flowers, which came in excellent condition, were grown in a cold frame, but they are perfectly hardy in sheltered situations, and they make a good addition to the flowers which bloom in April and May.

Last week a public meeting was held in Vineland, New Jersey, at which the fruit-growers of that region met with the merchants of Brooklyn, New York, Philadelphia, Trenton, Paterson and other cities to discuss the practicability of sending berries to market in packages which were not returnable. A good deal of money is now invested in these packages, so that this change cannot be made at once, but it looks as if the current of business sentiment is in that direction, and that the reform will come in a year or two.

Mr. John Thorpe is reported in the *American Florist* as having recently said that the project of an International Chrysanthemum Show was under consideration by a committee of the Local Directory of the World's Fair. A technical objection had been raised on account of a clause in the charter which might be construed so as to prevent the taking of an admission fee for entrance to the ground before the opening of the fair, but he believed that this point could be adjusted and that the exhibition would be held and be worthy of the great occasion.

Complaint is often made of Foxgloves and some other herbaceous plants which are sometimes sold as perennials, that they die away after flowering and are really biennial plants. *Meehans' Monthly* calls attention to the fact that they can be made true perennials if they are prevented from going to seed. It is the production of seed which exhausts the vital powers of the plant. If the stalks of Foxgloves and other plants are only cut off as soon as the flowers fade and before the seeds are formed, there will be no difficulty in having them live for a number of years. Those who wish to increase perennial plants rapidly do not let them flower at all. Where seed is needed, one or more plants can be allowed to produce and ripen it.

The question of our common roads has become of such general interest that it is no surprise to find it made the subject of the leading article in *The Century* magazine for this month. The letter-press of this article is good, but it is the illustrations which make it particularly valuable. No one can see the pictures of wheels blocked and horses and human beings struggling through mud knee-deep without being reminded of what is going on over a large portion of the northern states at this very hour. The waste of temper, vital

energy and time due every year to the bad roads of the United States, when taken in the aggregate, is a tax which nothing but a young and prosperous country could endure. No one can look at these pictures without feeling that delay in mending our ways is little less than criminal.

Much sound advice is condensed into a paragraph in the last *Country Gentleman*, which is written for farmers who seem to feel that a great deal of ground is needed for a fruit-garden, when in reality a small lot reserved for this purpose and properly cared for will yield much more than the ordinary home garden affords. Here is the advice: "Set off a piece of ground three rods wide and seven rods long, or a little more than one-twentieth of an acre. Lay it out in straight lines running lengthwise, so that all may be cultivated with a horse, and leave a space ten feet wide at each end for the horse to turn on; then plant three rows with Strawberries, one with Fay's Currants, one with Raspberries, one with Dwarf Pears and the rest with Grapes. With horse cultivation one hour's labor a week will keep the ground clean and mellow and will give a delicious supply of fresh fruit through the greater part of the season."

According to the act for establishing a botanical garden in this city, which was passed about a year ago, it was made necessary that \$250,000 should be raised by the incorporators before they could secure \$500,000 in bonds from the city and the use of the 250 acres in Bronx Park. Mr. J. Pierrepont Morgan and four associates were therefore entrusted with the task of soliciting subscriptions, and Mr. Morgan's plan was to obtain ten subscriptions of \$25,000 each. It is stated in the daily papers that he has already secured eight of these, and there will probably be no difficulty in raising the whole amount. Those who know what an establishment of this kind will cost will be pleased to learn that the subscription is not to stop here, but that many other persons who have expressed a willingness to pay \$10,000 and smaller sums will be permitted to contribute, so as to raise at least \$250,000 more, making a clean million dollars to begin with.

It is incorrect, according to the recent authority on the subject, to speak of the Chrysanthemum as the national flower of Japan, which rank really belongs to the Cherry-blossom. The mistake is probably owing to the fact that the Chrysanthemum is used as one of the crests of the imperial house, and has been highly honored by the court since at least as early as the ninth century, when garden parties were held in the palace for the purpose of celebrating its blossoming time, as in modern days yearly Chrysanthemum shows are held in the imperial gardens. "The ancient celebrations," says the writer from whom we quote, "seem to have partaken of a truly pastoral character, the courtiers wearing the plucked blossoms in their hair, drinking wine and composing verses upon the beauties of the flowers. The modern Chrysanthemum displays in the palace gardens are more like our own flower-shows in the social conventionality of their arrangement; but the numerous variety of every imaginable color and profusion of shape, arranged in long, open, rustic sheds, forms a brilliant and imposing scene hardly rivaled by any flower-show in the world."

In the last annual report of the Botanical Gardens at Georgetown, Demerara, it is said that bananas hold a very inferior place in the domestic economy and estimation of the general public as compared with plantains. They are not, as plantains are, regarded as an essential article of food, nor are they particularly sought for by the working classes when they come in their way. The preference of the inhabitants of temperate countries for the banana as against the plantain is due to the fact that as it is consumed raw, only a moment is required to become acquainted with and appreciate its merits. On the other hand, a long time and steady acquaintance is required before the plantain is properly appreciated. The most abundant bananas in the markets of Georgetown are the Dwarf or Chinese kind, and next to that the large and small Fig bananas. The large Indian banana differs from all others in its size, wide angles and softer texture, and is the best of all for cooking purposes, although, as has been said, bananas are almost exclusively used raw. They may, however, be preserved with sugar in various forms, or turned into jam or dried and packed like figs. These methods of preservation have all been tried on a small scale in various parts of the West Indies, but mostly in an amateur way. But no one seems to have thought it worth while to make the necessary outlay of money and time in order to place this fruit cheaply in the markets of temperate countries as other preserved fruits are. Samples never make a market for any commodity. Cheap and abundant supply is necessary to create a permanent demand.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLES:—Arbor Day.....	169
A Japanese Garden. (With figure.).....	170
The Danger of Fire in Woodlands.....	170
Notes of a Summer Journey in Europe.—XI.....	J. G. Jack. 171
Primitive Vegetables of Texas.....	J. Reverchon. 172
NEW OR LITTLE-KNOWN PLANTS:—New Orchids.....	R. A. Rolfe. 172
The Pepino. (With figure.).....	W. M. Munson. 173
FOREIGN CORRESPONDENCE:—London Letter.....	W. Watson. 174
CULTURAL DEPARTMENT:—A New Disease of the Tomato.....	E. G. Lodeman. 175
Fameuse and other Canadian Apples.....	T. Sterry Hunt. 176
Violets.....	T. D. Hatfield. 176
The Spring Garden.....	J. N. G. 176
The Water-garden.....	Wm. Tricker. 177
Primula Sieboldi.....	Charles H. Rea. 177
CORRESPONDENCE:—Mid-March in Northern California.....	Carl Purdy. 177
Notes on Grafting.—III.....	A. W. Pearson. 178
Impressions of Leaves.....	Hugh D. Vail. 179
RECENT PUBLICATIONS.....	179
NOTES.....	180
ILLUSTRATIONS:—The Pepino, <i>Solanum muricatum</i> , in fruit, Fig. 26.....	173
A Japanese Garden, Fig. 27.....	175

Arbor Day.

DURING the past month we have received several reminders of the approach of Arbor Day in the way of circulars and pamphlets suggesting proper exercises for the ceremonial observance of that festival. They are generally issued by the State Superintendents of Public Schools, and contain a good deal of music and poetry, with selections in prose and verse suitable for recitation. Every effort to make this celebration an attractive one is praiseworthy, but in addition to the songs and orations we should like to see in these programmes greater effort to instruct the young people in some of the advantages and uses of trees, some of the fundamental facts relating to their growth and structure, and particularly some explicit directions as to planting them and caring for them afterward. Arbor Day is intended to encourage tree-planting. Its highest use is only reached when children, and their parents, too, are moved to plant the best trees in the best way. It requires no great amount of intelligence to thrust the roots of a tree into a hole in the ground; but to plant a tree as it should be planted—that is, to plant it so that it is likely to attain its best possible development and reach a green old age—is a work that requires care and skill. There are few things which men do where the difference between careless work and good work will show so plainly, or for so long a time, as in the planting of a tree. In the first place, the site for planting should be intelligently chosen, then the variety suited to the peculiar soil and situation and use for which it is intended should be considered. A good specimen of this particular tree should be selected and the ground should be thoroughly prepared to receive it. Even then, after the soil is properly firmed about its roots, the tree should not be neglected and suffered to fall a prey to insects or fungi, or allowed to starve for lack of food or water, or to be loosened by the wind.

One of the most instructive exercises of Arbor Day in

every district where the day was celebrated last year, or in the years before, would be an examination by the children of the trees which had previously been set out, to see what proportion of them were thrifty and had made as good a growth as could have been expected. Professor Beal once related a very instructive incident in these pages. A few years ago each class and society of the Michigan Agricultural College planted a memorial tree with some ceremony. These trees were publicly accepted by the President, and the care of them was guaranteed. A year later reports were made which proved how much easier it is to plant a tree than it is to give it proper care afterward. Of the twelve trees not one had made satisfactory growth, none had been mulched, only one had received any cultivation, one was dead, two nearly dead, one had been cut down, and nearly all the rest of them were having a severe struggle with thin soil, grass, weeds, lack of moisture and insects and fungi.

It is a beautiful custom—this planting of memorial trees—but in order to make it impressive the trees must live to vigorous and venerable old age. A memorial tree of feeble growth and early decrepitude only serves to remind us that it was originally a bad specimen or that it had been badly planted or badly cared for. No excuse can ever be given for planting a tree carelessly or improperly. There may be particular reasons for planting trees closely together, as, for instance, where a rapid upward growth is desired, but for memorial trees ample room is needed. A melancholy example of improper planting in this regard is furnished by the so-called Hamilton trees on Washington Heights, in this city, about which there is so much sentimental discussion in the papers just now. These are thirteen Liquidambar-trees, said to have been planted by Alexander Hamilton to commemorate the original states of the Union. In *Harper's Young People*, last week, there is a good illustration of these trees, and it will be seen that they form a dense clump, standing within an area not more than fifteen feet square, where they could not possibly make a healthy growth. Old as they are, several of these trees are so choked and crowded that their trunks are scarcely eight inches in diameter, although the largest ones are two feet in diameter. None of them, however, has anything like a symmetrical development, and an examination of their tops shows much dead wood in all of them. If Alexander Hamilton or some one else had planted one tree in this spot where thirteen now stand, it would have cast a larger shadow than all of them together now do, and instead of being sickly and moribund it would now be giving promise of another century of vigorous life.

It is outside of our purpose to repeat here the elementary rules for planting trees and for protecting them. What we wish to insist on is that attention to the trees themselves is the matter of paramount importance, while talking and singing of them are of temporary and comparatively trivial moment. Even under the best auspices one day in a year devoted to trees will count for very little. The real advantage from the observance of Arbor Day comes where it is made a pleasing incident in a perennial and ever-growing interest in the study of natural objects. Some of the state horticultural societies have done very wisely in offering to furnish seed and plants under certain restrictions to district schools, in order to encourage the cultivation of flowers and shrubs on school-grounds. Others have offered to school-children prizes for collections of wild flowers and for classified lists of the birds and insects found in their districts. In an Arbor-day circular from Wisconsin we find directions for making and keeping a lawn, which is an admirable idea where the grounds are so large that the whole area is not required for a playground. The essential point is to encourage among school-children a personal interest in trees and shrubs, not simply for their use in making the school-grounds an attractive place, but for the development of habits of observation, which is of itself a liberal education. The habits of investigation which distinguish a man of science from his fellows are the very ones which are natural to young children, and which are too often repressed

in schools, where they should be encouraged. Just now, when all nature is quickened with new life and when the beauty and melody and fragrance of spring are appealing to our awakened senses, every child is eager to respond to the invitation from the woods and fields. The most fascinating objects for study abound by every wayside and in every thicket, and all the alert young faculties need is proper direction and encouragement.

A Japanese Garden.

THERE have been many allusions in recent comments on Japan to the picturesque gardens for which it is distinguished, but, however clear a description may be, it lacks something in definiteness, so that the illustration on page 175 will be of use in helping our readers to form an idea of one of the graceful and harmonious scenes that the Japanese delight in contemplating. In summer, when the sliding front of the house is rolled back, the master sits where he can look out upon his little domain, and the very decorations of his apartment are nicely calculated to harmonize with the character of his garden.

The picture gives us the situation of the buildings, and shows the enclosing stone wall, surmounted by a fence of plaster, with a battened coping of polished wood. Sometimes bamboo, interlaced in a pattern, is used for fences with very agreeable effect, and again hedges of Camellias are employed to enclose the grounds.

In the garden represented, the surface is naturally irregular, but the rising ground in the rear is made more effective by artificial mounds, which have been constructed to vary the slope. A miniature lake, encircled by greensward, and overarched by a light bridge of Bamboo-poles, is fed by a cascade from the hill, shaded by Willows. Groups of the red-flowering Azalea grow at its foot, with rushes and aquatic plants. Volcanic rocks with encrusted surfaces are here disposed to give wildness to the scene, and they are also placed elsewhere about the grounds, or on the borders of the sheet of water for ornament. Flat slate stones are also scattered about the greensward, to serve for paths, being found throughout Japan of convenient size and shape for stepping-stones, for which they are used everywhere.

Climbing the elevations we came to a thatched pavilion, from which there is an outlook upon the garden and upon the distant prospect. Near this, on the right, is a group of evergreens, and on the left we catch a glimpse of a little thicket of Bamboo, and the broad leaves of a Magnolia, the grassy slopes of the elevations being relieved by the smaller mounds, which lead like foot-hills to the turfed level below.

Here are groups of deciduous trees, and mingled clumps of Cypress and Cherry-trees in blossom, the white flowers showing in masses against the dark evergreens. Near the wall, in the foreground on the left, half-buried in bushes, is a windowed summer-house, with a high fence to insure privacy. This is hidden by an angle of the wall from an arbor with an arched entrance, near which stands one of the ornamental stone lamps with which the Japanese are fond of adorning their pleasure-grounds. A shrub in flower, probably the Hawthorn, grows beside the lamp, and also a few dwarf Cypresses. The tall evergreens upon the hill, and also those planted near the buildings as a shelter and screen, are Cryptomerias, the largest and most valuable cone-bearing trees of Japan.

Without the garden is a graveled court, from which a gate and flight of steps lead to the street, and in the corner of this court-yard are a Plum-tree in full bloom, and two Pine-trees, one of which is trained into a conventional form, apparently to overshadow the door in the garden-wall. Here we see the porch where the gate-keeper sits, which affords an entrance to a long low building communicating with the women's quarters, the larger of the two constructions being the dwelling of the master of the house.

There is in this little garden into which the cottages open an effect of harmony and repose. Proportion is well considered, and grace of line prevails, with agreeable masses of foliage where required. Though highly artificial, the tiny pleasure-ground is so simple and quiet, there is such a pleasant breadth about it that we gain an impression of space and dignity and suggestiveness that is often lacking in a far more spacious demesne. It gives a hint for a way of treating a large domain, where the miniature landscape might be reproduced on a more imposing scale with equal effectiveness, or it could be copied with advantage in a suburban villa of limited space, or used to form a surprise in some corner of a large estate.

In the Japanese book from which this illustration is drawn, are many other designs for the treatment of grounds of greater or less extent, which are full of interest, as showing the picturesqueness of the ideas of this artistic people when applied to landscape-gardening. No matter how small his enclosure, the gardener of Japan spares no pains to make his plot of land suggestive as well as beautiful. He will create in the sand of his back-yard a tiny Sierra, or fashion the gravel, by bridges and mounds, and carefully calculated strokings of the surface, into a suggestion of a lake or river. There is apparently no limit to his imagination, and like a child he enjoys his toy and invests it with whatever fancy pleases him. Thus through the mind he gains a larger outlook, and of a trifle makes a semblance of the universe, with that wise and gay philosophy which supplies material lacks by pleasures of the imagination. This cheerful gardener who, with fertile fancy, creates his own paradise, has discovered the secret of content,

And having little, yet hath all.

In the eastern and northern states the danger from fire in woodlands is greater just at this time than at any other period of the year. The snow has melted; high winds have dried the surface of the ground, which is often covered with fallen leaves or with long dry grass and weeds, and the young growth of shrubs and other plants saturated with water has not yet appeared to resist the spread of fire. The conditions, therefore, are favorable for destructive conflagrations. This is the season, too, of rural spring cleaning; on every farm, on every country estate and villa lot, fires are kindled now to destroy leaves and brush, dead wood, and all the other refuse material that has accumulated during the year. It is usually a season of great atmospheric dryness and of high winds; bonfires carelessly lighted or carelessly tended escape control, reach meadows covered with dry grasses or woods strewn with dried leaves, and, soon getting beyond all control, spread to the forest and sweep on until their progress is stopped by a stream too broad to leap or until they are quenched by a rain-storm. Tens of thousands of acres of forest-land are burnt over every spring in the United States by fires started on farms; millions of dollars' worth of property is consumed, and many families are rendered homeless. During the month of April it is not an uncommon thing in some parts of the country to see the sun obscured for days together by the smoke of these fires, and every year at this time the columns of the daily journals are filled with accounts of the suffering and the losses caused by them.

It is necessary to build bonfires, although there are too many of them, and a great deal of good plant-food goes up in smoke in this country instead of being returned to the soil, but the management of such fires should be given to careful and responsible men; they should not be built when the wind is high or very near woods, or in long dry grass. The centre of a plowed field is the best place for a bonfire; it should never under any circumstances be left smoldering at night. This is a lesson we might have learned from the Indians, for an Indian never left a fire burning when he left his camp. The forest and the prairie meant too much to him, and he took no risks which might lead to their injury. His white successors are more indif-

ferent and more careless of personal safety and public prosperity. We have long held the view that there can be no protection for woodlands in thickly settled parts of the country until the community is sufficiently educated about the value of the forest to make possible the enforcement of a law under which town officials chosen for the purpose can have supervision and control over the manner and time of setting brush fires, and which should make it unlawful for any man to build a fire in the open air until he had obtained permission to do so.

It is evident that the value of the forest is better understood and more fully appreciated now than it was a few years ago, although perhaps this hardly appears yet in any perceptible diminution in the number of forest-fires. As a people, however, we are very far from that degree of intelligence and civilization which will permit interference with our action on our own land, and until that time comes the rural press cannot do the country better service than by preaching caution in the building and care of fires in the neighborhood of woodlands.

Notes of a Summer Journey in Europe.—XI.

FROM Copenhagen I went to Cassel by way of Hamburg, and short stops were made at both places.

In most of the German cities visited I was surprised to find the Elm so little used as a shade-tree, but in Hamburg the English Elm (*Ulmus campestris*) is quite commonly planted, and there are some fine avenues of it, forming beautiful gothic arches over a number of streets. Very uniform rows of the Linden (*Tilia vulgaris*) are also to be seen, all the trees being of about the same size, at equal distances apart, and in fine condition. The advantage of planting only one kind of tree in a single line is well shown here, and, altogether, the streets of this city are much better than the average in the matter of shade. Sometimes the foliage of the Lindens, Maples and Elms had a gray appearance, owing to attacks by little red mites, and in a few cases the Lindens had lost many leaves from this cause.

The site of the old fortifications, extending in a semicircle within a part of the city, forms a pleasant, though narrow, park-like promenade and recreation-ground. Our common Locust has been much planted here, and as it is free from the attacks of the borers which specially trouble it in its native land, it attains to fine proportions, some of the trees being three feet in diameter. The White or Silver, the Ash-leaved and the European Field Maples (*Acer campestre*) have all attained fine size. A specimen of the Striped Maple (*A. pennsylvanicum*) was noticed, which is grafted on the Sycamore Maple (*A. pseudoplatanus*) at five or six feet from the ground. Both stock and cion have grown at about the same rate and are now a foot in diameter; but the difference in bark makes the point of juncture very noticeable and forms an unpleasing contrast. The borders of ponds and banks of the streams are often made pretty and natural by grasses, reeds, shrubs and overhanging trees.

The Botanic Garden at Hamburg is arranged according to Endlicher's system of classification. In some respects the collections are not so interesting as those at Copenhagen, and at the time of my visit (August 15th) the garden had a somewhat weedy and neglected appearance. It seemed odd to find the Norway Spruce still labeled "*Pinus Abies*," and the European Larch as "*Pinus Larix*." There are a number of good examples of American trees here, among them *Taxodiums*, Black Oaks, *Gymnocladus*, *Liriodendron* and *Magnolia acuminata*.

Perhaps the most interesting tree in the garden is a specimen of the so-called Byzantine Hazel (*Corylus Colurna*). Our American Hazels are all mere shrubs, and we are apt to think of all Hazels as little more than bushes. *C. Colurna*, however, becomes a tree, and the specimen in the Hamburg garden is perhaps a fair example of what it may be at maturity. This is a tree about sixty feet high, and with branches shading a piece of ground forty-five or fifty feet across. The trunk is two and a half feet in diameter at three feet from the ground, and it divides into three main limbs at five or six feet. The branches diverge at a somewhat sharp angle, and the bark of the trunk is gray and rough. It is a finely shaped tree with rounded top, and at a little distance it has something of the outline and aspect of a small-leaved Linden. Not much space is given to greenhouses, and a *Victoria regia* house is considered the chief attraction.

South of Hamburg the railroad to Cassel passes through the great Lüneburg Heath, a series of sands and bogs densely covered with a thick close growth of Heather (*Calluna*), which had just come into good bloom at the time I passed through, so that the wastes were assuming a purple color. Enormous quantities of Scotch Pine, some White Birch and Alder, and also Norway Spruce, have been planted in various places, so that the country wears less of a barren look than it once did.

Probably no part of Germany possesses and shows such favorable conditions for the growth of trees as Cassel and its vicinity. The park known as the "Auegarten," said to have been designed by Le Nôtre, the illustrious French landscape-gardener, is regarded with feelings of pride by the present generation of the citizens of Cassel. The trees have attained splendid proportions, are in excellent health and vigor, and are generally so planted and grouped as to give plenty of chance for development, and at the same time leave openings which afford many pretty and varying vistas. A better and much more beautiful and picturesque treatment of the water might easily be made, for the banks of the ponds are generally rather bare and uninteresting.

This little park is less known than it deserves to be, and perhaps this is in part due to the fact that the park, water-falls and gardens of Wilhelmshöhe are so near and are so much more attractive to the popular mind. Wilhelmshöhe, with its Hercules, its artificial water-falls, grottoes and fountains, presents a striking contrast to the simplicity of the Muskau Park, which has been already noticed; and when the magnificent situation of Wilhelmshöhe is considered, it is easy to imagine how much more might have been made of it in different hands and with different ideas of landscape-design. The great cascade, nearly a thousand feet in height, or rather in length, at a little distance, looks more than anything else like a gigantic stairway built for the descent of Hercules, though it remains a mystery how Hercules is to get down from his pedestal on the top of the mountain. Leaving out these attractions, however, there are many beautiful and picturesque stretches and vistas in the park, where no offensive artificiality is apparent. There is much quiet natural beauty in the woods of Wilhelmshöhe, and its handsome healthy trees have an attraction for every one interested in dendrology. Before fairly entering the park, on the way from Cassel, one is struck by the fine proportions and vigor of the groups and specimens of Lindens, and for a study of these trees there can be few better places. *Tilia parvifolia* and *T. platyphyllos* are the most abundant and furnish the finest examples, but *T. vulgaris* and *T. argentea* are also growing with them. The last was in full bloom (August 17th) and very fragrant, while the fruit of *T. platyphyllos* was conspicuous by its large, full size.

Within the park proper and on the lower part of the mountain, the Silver Firs (*Abies pectinata*) and the Norway Spruces form the finest and noblest examples of tree-growth to be seen in the region. There are many fine groves and groups of these, many individuals with trunks almost four feet in diameter and perhaps a hundred and thirty feet in height. Some very fair specimens of our White Spruce (*Picea alba*) seem like dwarfs beside the magnificent Norway Spruces, but the first have only been planted about sixty years, whereas the others have perhaps been growing for two or three hundred years. The Norway Spruces here do not give the impression of a straggling or ugly habit, so much complained of in America when the trees become old. Good specimens of the Red Cedar (*Juniperus Virginiana*) have much of the aspect and are about of the average size of those usually seen in New England. Here we find large old specimens of the European White Birch (*Betula alba*), with slender, string-like branchlets eight or ten feet long depending perpendicularly from the branches. These slender, drooping branchlets are a striking peculiarity of old specimens of the Norway Spruce and of this Birch, a characteristic rarely seen in our allied north-eastern American trees. Many of our native trees and shrubs are to be found here, and apparently nearly all such as are hardy grow with the same luxuriance as the indigenous arborescent vegetation. The coldest temperature here rarely, or almost never, touches zero of Fahrenheit, and although Wilhelmshöhe is situated at a higher elevation than the city of Cassel, it is said to be liable to less severe cold in winter. This is accounted for by the presence of the surrounding woods and the open running waters. A little tree rarely seen in cultivation, though early introduced, is our Dwarf Chestnut, or Chinquapin (*Castanea pumila*), which I found here twelve feet high and fruiting freely. Such of our deciduous trees as the Striped Maple, Common Catalpa, Willow Oak (*Quercus Phellos*), etc., are represented by very good mature specimens; while *Pinus ponderosa* and other American conifers are large enough to bear

plenty of fruit. The purple-leaved Myrobalan Plum, commonly known in nurseries as *Prunus Pissardi*, is here a tree eighteen or twenty feet high, and is probably one of the largest in Europe.

Through the kindness of the courteous Hofgärtner, G. Fintelmann, I was shown the collections within some private enclosures, where many of the rarer and choicer plants are kept. A part of these enclosures is devoted to glass houses and frames containing plants with which I am not familiar. Among these may be mentioned very fine hybrids of *Streptocarpus Rexii* and other species, and a magnificent collection of *Begonias* well worth going a long way to see. These *Begonias* are a specialty at Wilhelmshöhe, and some of the single and double yellow flowers are particularly fine. In the collection are some fine forms of the Peruvian *Begonia Davisii* and *B. polypetala*. Much care is taken in propagating and selecting these plants, and they are not distributed, but strictly kept for home use.

Of all the plants in the open air within the enclosures, perhaps the best and most interesting specimens are two examples of the Japanese Umbrella Pine (*Sciadopitys verticillata*), both of the same age and from the same lot of seed. One is fifteen feet high and of erect open habit, while the other is only about seven feet in height, is much more compact and has a broader spread of branches, so that it seems as though an equal amount of growth and development had been expended in this direction as in attaining a height of fifteen feet. When I saw it the taller plant was bearing fruit and good seed. The first cones and seeds were produced five years ago, and the seedlings raised from these show the same tendency to vary and separate into the two forms—one with an erect slender growth, the other with a dwarfier, more compact habit. The cones of the Umbrella Pine are pendulous, and are produced on the upper branches above the male flowers; and, unlike those of the true Pines and some other conifers, they mature in one season. The Wilhelmshöhe plants are not so tall or large as some to be found in other places on the Continent and in England. Though not remarkable as a specimen, another fruiting conifer was *Torreya nucifera*, of Japan, whose egg-shaped fruit somewhat resembles enormous berries of the Yew. The *Torreyas* are rather rare in cultivation, and they are hardly capable of well withstanding climates much colder than that at Wilhelmshöhe.

It was pleasant to see the *Rhodora* thriving here in fine clumps; and a charming little rockery contained, among other interesting things, a quantity of the little Dwarf Cornel, or Bunch Berry (*Cornus Canadensis*), which was still producing a few stray flowers. *Fatsia horrida* has generally been regarded as a rather difficult plant to cultivate, so that it is perhaps one of the rarest and most unusual shrubs in collections. A specimen here was bearing bright scarlet fruit, but the flowers are said to be liable to some injury by late spring frosts. It may be that, besides the cultural attention it gets here, this *Aralia* also finds something in the half-mountainous, temperate and moist situation and climate which distantly corresponds to its native home in north-western America.

Arnold Arboretum.

J. G. Jack.

Primitive Vegetables of Texas.

IN the spring of the year 1855 a body of French colonists, fresh from the old country, established themselves in Dallas County, Texas, which was at that time very thinly settled. Game was plentiful, fish not scarce, and beef very cheap, but beyond Indian Corn and Wheat no vegetable food could be obtained. As a rule, the French are not a carnivorous people, and therefore the lack of vegetables in variety was keenly felt. True, the colonists had brought along with them vegetable-seeds of many kinds, but when they arrived the season was already too far advanced to permit a proper preparation of the ground, and the weather that year was so dry that hardly anything would grow. The crop therefore was a flat failure, and the suffering colonists were forced to search among the wild plants for some substitute for the vegetables they so highly prized.

The earliest plants to attract their attention in the spring were two species of *Astragalus*, one of them *A. Plattensis*, growing in sandy soil, and the other *A. caryocarpus*, growing in black prairie-land, and bearing early flowers not devoid of beauty, which are succeeded by round, fleshy, sweet pods of the size of a large gooseberry, to which they have some resemblance. These were called buffalo peas, or prairie apples, and they were used as substitutes for garden peas, and rather unsatisfactory substitutes they were. Children, and oc-

asionally grown persons, ate them raw, and in that way they were really more acceptable.

In the way of salads the country was more generous. A true Lettuce was found (*Lactuca scariola*), a perennial, and quite an early plant, which was succeeded by a kind of Dandelion (*Pyrhopappus multicaulis*) and a Primrose (*Oenothera trilobata*). This last is worth more than a passing mention. It is an annual plant which grows in winter and early in the spring, and which produces in long succession large bright yellow flowers, each one of which lasts for a day only. They spring from the ground, having no peduncles, and the plant, which is quite ornamental, has no stems. The large square capsules or seed-vessels are borne in large conical bunches, which are not unlike the pineapple in appearance, and are very striking after the leaves have disappeared. The plant is used as a salad just as the Dandelion is. The Lamb Lettuce was represented by the *Valerianella amarella*, and for Celery an early stemless plant belonging to the Umbelliferae was used (*Peucedanum foeniculaceum*), whose blossoms and leaves much resemble those of the Sweet Fennel, although it tastes like Celery. Two species of wild Onions were also used; these were *Allium Canadense* and *A. Nuttallii*.

Another plant which deserves mention is a bulbous one belonging to the Iris family, and closely related to the *Tigridia*. It is *Nemastylis geminiflora*, and it was found growing abundantly in the black prairies. It produces a small brown bulb that is farinaceous, sweet and palatable, and the hogs were so fond of them that when free they nearly exterminated the species. It is not improbable that with care and cultivation this would prove of some real value as a garden-vegetable, and, as it is, it well deserves a place in the flower-garden. It bears a dozen or more flowers on each stem of a beautiful blue, or sometimes white. Most of these vegetables are little used now since better ones have taken their places; but the four salad-plants I have mentioned are still in use not only by the French, but by the American settlers, who have learned to appreciate their value.

Dallas, Texas.

J. Reverchon.

New or Little-known Plants.

New Orchids.

CYPRIPEDIUM × *BACONIS*, Kränzlin, is a secondary hybrid raised in the establishment of Messrs. F. Sander & Co., of St. Albans, from *C. chlorops*, Rchb. f., crossed with the pollen of *C. Schlimii*. It is said to have flowers much resembling the mother plant, and to be of easy and luxuriant growth. The seed was sown in November, 1888, and the seedlings flowered in January last.—*Gardeners' Chronicle*, February 6th, p. 171.

CATASETUM LIECHTENSTEINII, Kränzlin.—A species very closely allied to *C. Trulla*, Lindl., which appeared in the collection of the Fürst Liechtenstein. The pendulous raceme is said to bear about twenty flowers, with grassy green sepals and petals, and a similar lip, with blackish brown on the edges and lower parts.—*Gardeners' Chronicle*, February 6th, p. 171.

CYPRIPEDIUM × *LEDA*, Hort.—A hybrid raised in the collection of John C. Bowering, Esq., of Forest Farm, Windsor, from *C. Harrisianum*, crossed with the pollen of *C. venustum*. It is said to be fairly intermediate in character, except that the purple stripes on the dorsal sepal of the mother plant are almost obliterated, and the sepals somewhat approaching those of *C. villosum*.—*Gardeners' Chronicle*, February 13th, p. 202.

CYCNOCHES GLANDULIFERUM, Rich. and Gal.—A Mexican species, long very imperfectly known, which has flowered both with Mr. W. Bull, at Chelsea, and Mr. J. Charlesworth, of Heaton, Bradford. The male flowers, which are light green, spotted with brown, with a white lip, are borne in a long pendulous raceme; the females are at present unknown.—*Gardeners' Chronicle*, February 13th, p. 204.

CYPRIPEDIUM CHAMBERLAINIANUM, O'Brien.—A very distinct and beautiful species imported from some part of New Guinea by Messrs. F. Sander & Co., of St. Albans. It belongs to the same group as *C. Rothschildianum* and *C. Stonei*, though it has so few characters in common with them as to have been described as the first of a totally new section of *Cyripedium*. Native specimens have spikes

showing from twelve to as many as twenty flowers, the bracts being much closer together than usual. The flowers are yellowish white with rosy purple markings. The petals are spirally twisted, comparatively short, and nearly horizontal, and the pouch much inflated. It is a great

CYPRIPEDIUM × LUCIE, Hort.—A hybrid raised by Monsieur Moreau, of Paris, by crossing *C. Lawrenceanum* with the pollen of *C. ciliolare*. It bears a strong resemblance to the mother plant, though somewhat modified in the direction of the other parent.—*Orchidophile*, 1892, p. 17, with colored plate.

Kew.

R. A. Rolfe



Fig. 26.—The Pepino, *Solanum muricatum*, in fruit.

acquisition.—*Gardeners' Chronicle*, February 20th, pp. 234, 241, fig. 34.

DENDROBIUM O'BRIENIANUM, Kränzlin.—A Philippine species, introduced by Messrs. F. Sander & Co., of St. Albans. The small flowers are yellowish green, and borne in long drooping racemes. It flowered at St. Albans in the autumn of last year.—*Gardeners' Chronicle*, February 27th, p. 266.

The Pepino.

OUR experience in fruiting the Pepino during the past year differs somewhat from that of Professor Bailey, as detailed in a recent bulletin from the Cornell University Experiment Station.* The experiment at Cornell, an account of which was given in *GARDEN AND FOREST* (vol. v., p. 95), seems to indicate that but one fruit sets in each flower-cluster. Of our plants one bore two fruits in the manner described, while the others, cuttings from the first, were much more prolific, bearing six to eight fruits in each cluster. The accompanying photograph represents one of these plants. The photograph was taken on February 25th, and the plant was about three feet high. It will be observed that the peduncles are not elongated to such an extent as they are when only one fruit develops. I have noticed the same trait in the Egg-plant. That is, when fruit fails to set, the stem and calyx are often elongated abnormally.

In view of the natural habitat of the plant, in the highlands, where the temperature is relatively low, and of the fact that the fruits never set well in Florida except during a cool period, it would seem that we have some hints for treatment under glass. Heretofore I have never succeeded in obtaining any fruit, though the flowers were repeatedly pollinated by artificial means. The plants at this time were grown in a Tomato-house with a night temperature of sixty to sixty-five degrees. During the present season the treatment has been very different. The plants were from cuttings started in May. During the summer they were in four-inch pots plunged out-of-doors. In the fall they were removed to six-inch pots and placed in the house. Since then they have been kept in a cool house—forty-five to fifty degrees—and have received no bottom heat. This treatment has proved much more satisfactory than the other in inducing the fruit to set; but, as before, a large proportion of the blossoms fail to set fruit. The lower

temperature seems also to develop to a higher degree the peculiarly rich flavor of the fruit. Professor Bailey compares the flavor to that of a "juicy, tender, somewhat acid egg-plant." With us the flavor has been decidedly musky; so much so, that when tested recently by several parties

* Bulletin 37, Cornell University Experiment Station.

the universal comment was, "much like a cantaloupe." There is, however, an agreeable acidity which is very distinct.

It seems certain that the Pepino will prove a valuable acquisition if we can determine the proper conditions for fruiting it under glass.

Maine State College.

W. M. Munson.

Foreign Correspondence.

London Letter.

RANUNCULUS CORTUSÆFOLIUS.—A flowering specimen of this plant, which was described by Sir W. Hooker forty years ago as "unquestionably the handsomest of all the Buttercups," was a special attraction at the last meeting of the Royal Horticultural Society. It was sent by Lord Hylton, of Merstham House, in Surrey, where I am informed it grows well in the open air with a little protection in winter. It is a rare plant in English gardens, notwithstanding its introduction forty years back and the unquestionable beauty of its flowers. It has a large fleshy, tuberous root-stock, an erect stem as thick as a man's little finger, and sometimes four feet high, freely branched above. The leaves are a foot across, slightly lobed and toothed, hairy, as also are the stems. The flowers, which are in large, broad, crowded corymbs, are erect, two inches or more across, golden yellow, varnished or shimmering, as in all Buttercups, the petals of good substance, the fragrance strong and pleasant. The Rev. E. J. Lowe, writing of this plant in *Hooker's Journal of Botany* (vol. ix., 69), says it is a very striking, large and handsome plant, of almost gigantic size and stature in its genus and of a noble appearance. Its enormous Buttercup-like flowers are conspicuous at considerable distances on the ledges within the clefts of high rocks or cliffs in the ravines in Madeira. It is also found in the Canary Islands. Another name for it is *R. grandifolius*. At Kew the plant is not hardy, but the late Mr. Giles Mundy grew it well in his little garden at Farnham. It is curious, too, that, while Mr. Smith stated in the *Botanical Magazine*, under tab. 4625, that it required the protection of a frame or handlight in winter, Sir W. Hooker says in the same place that "it is quite hardy." In favored localities I know it thrives in England. It is worth growing as a pot-plant for the sake of its handsome fragrant flowers which open in March.

SCHIZOCODON SOLDANELLOIDES.—A living example in flower of this very interesting little Japanese plant has lately been sent to Kew by Captain A. Torrens, who collected it while in Japan, and in whose garden in Kent it has flowered probably for the first time in Europe. Its interest lies in the fact that it is very closely related to *Shortia galacifolia*, which, I believe, has been found wild in Japan as well as in North America, and used to be known as *Schizocodon uniflorus*. There is a close family resemblance between this new-comer and the *Shortia*, but the former has a short decumbent stem, shining green ovate, cordate leaves about an inch long, and a two-flowered scape. The flowers are like those of the *Shortia*, but more cupped, and with linear instead of scale-like staminodes. A figure of the plant has been prepared for publication in the *Botanical Magazine*.

DENDROBIUM PHALÆNOPSIS SCHRÆDERIANUM.—The plants recently introduced by Messrs. F. Sander & Co. are proving exceptionally rich in variety both of color and size of flower. At the last meeting of the Royal Horticultural Society a group of about a dozen plants, all in flower, was shown by an amateur, Mr. E. M. Mundy, and among them was one with almost pure white segments, another with mottled segments, and one with flowers of the deepest colors, and exceptionally large in size, measuring four inches across. These flowers were all produced from newly made growths, a fact which proves that under cultivation this *Dendrobium* will grow well—far better than most of the *Dendrobiums* from the same region. We have

plants of it growing freely in a hot moist house, such as suits *Phalænopsis*, but unshaded.

COCOS WEDDELLIANA.—This is the most popular of all the Palms which are grown here for the decoration of rooms, dinner-tables, etc. It is easily grown, assumes an elegant appearance from the first, and it always sells well. Over one hundred thousand seeds of it were sold by auction in London a few days ago. Although discovered by Dr. Weddell in 1831 it was not introduced into cultivation until about thirty years afterward, when L. Van Houtte, of Ghent, distributed it under its present name. A few years later it again appeared under the name of *Leopoldinia pulchra*, and at a still later date as *Glaziova elegantissima*. There is a figure of it in Wallace's *Palms of Brazil*, where it is called *Leopoldinia pulchra*, and described as an elegant Palm, with a stem eight to twelve feet high and two inches in diameter with leaves seven feet long, which, on certain saints' days, are used for the decoration of altars and similar sacred purposes. It is so abundant in some parts that its stems are commonly used for making fences. The seeds are ovoid and one and a half centimetres in diameter.

C. insignis, otherwise known as *Glaziova insignis*, is almost as elegant a plant, the fronds being a little broader in the pinnæ and the stem perhaps a little thicker, otherwise it is quite as strikingly graceful. It has the merit, too, of being satisfied with the temperature of an ordinary greenhouse. There is a good example of it in the winter garden at Kew, which has borne the minimum temperature of forty to forty-five degrees for the last two winters without suffering in the slightest. It would certainly thrive in the open air in the warmer states; for instance, in south California. It is a native of Brazil.

A BAMBOO GARDEN.—This is the latest addition to the special gardens at Kew. Hitherto the hardy Bamboos have been scattered over the garden or grown in a position ill-adapted for some of the kinds. The new garden is about a quarter of an acre in extent and is oval in form, with sloping banks and a large depressed central area. The garden is surrounded by trees, to which an informal belt of shrubs has been added. Beside Bamboos it is proposed to grow in this place all the large hardy Monocotyledonous plants, such as hardy Palms, Yuccas, *Gyneriums*, *Arundos* and *Eulalias*. The species of Bamboo known to be hardy at Kew are the following: *B. Metake*, *B. Simoni*, *B. viride glaucescens*, *B. Quilloi*, *B. palmata*, *B. tessellata*, *B. Fortunei*, vars., *B. nana* (Hort.), *B. nigra*, *B. mitis*, *B. quadrangularis*, *B. Kumasaca*.

SHRUBS FOR FORCING.—Flowers out of season have an attraction for most people. Plants that may be made to produce their flowers at a time when there is a dearth of bloom are of special value in the garden. To know what plants will force well is to be well equipped for emergencies in flower demand. There are, of course, numerous old stagers, such as the old white *Azalea*, *Camellias*, *Azalea mollis*, *Roses*, grandest and most useful of all, and now not considered out of season at any time of the year. Then we all force *Hyacinths*, *Dicentra*, *Spiræa* (*Astilbe*), *Daffodils*, *Tulips*, etc. There are beside these numerous other plants of special value to force, and some of the best of these are shrubs. We use *Forsythia suspensa*, a beautiful plant when forced; *Prunus Pissardi*, *P. triloba*; *Pyrus malus*, var. *floribunda*, whose beautiful wands of white flowers are rendered more beautiful by the rich crimson color of the unopened buds. *Staphylea Colchica* is now as well known as *Deutzia gracilis*, still one of the best of white-flowered plants for this purpose. Lilac, too, is becoming common, and so is *Daphne Genkwa*, the blue Japanese species. The red-flowering Currants are charming greenhouse-plants when forced so that their branches are wreathed in flowers in February. The large-flowered *Laurestinus*, known as *lucidus*, is beautiful when forced. Nothing could be more beautiful than pot specimens of the double-flowered Peaches when forced into flower by the end of February. Well managed, the branches are laden with large Stock-like blooms, beautiful in the mass, and

valuable for bouquets and such like flower-arrangements. *Spiræa confusa* has crowds of bunches of white Hawthorn-like flowers. Many of the early-flowering shrubby *Spiræas* would force well. Guilder Roses are prettier when properly forced than they are out-of-doors. To force flowers simply to get them out of season is a practice with little to recommend it, but to be able to keep up a supply of flowers all the year round for the conservatory and indoor use by subjecting suitable plants to a higher temperature than they really require is good gardening. The Royal Horticultural Society offered prizes for the best collections of forced shrubs to be exhibited this month, but nothing of special value was shown. There were, however, beautiful pot Roses from the Pauls; *Azalea mollis* and Lilacs, besides lovely basketfuls of flower-branches of double Peach and Forsythia from Messrs. Veitch.

London.

W. Watson.

leaf-areas lose their dark green color, and become light green; these portions soon turn yellowish, and at the same time the leaf begins to curl, the outer edge being generally drawn downward. This causes the leaves to appear considerably smaller, which is quite characteristic of the disease. The discoloration of the leaves progresses slowly, while the portions which were first affected gradually die, giving the leaf a spotted appearance. The spots increase in size and their form becomes very irregular, and in this manner each leaflet succumbs. Upon the fruit the first symptom is a translucent appearance of portions of the outer wall. The centres of these portions turn brown and then black, while the disease spreads more or less rapidly at the outer edges, where a border of the translucent tissue is generally found. The fruit borne by diseased plants also appears to be more irregular than that upon normal plants.

The Tomato-plants are grown in boxes, and the manner in which the disease spreads from one to the other is not known. The plants first affected were situated at one end of

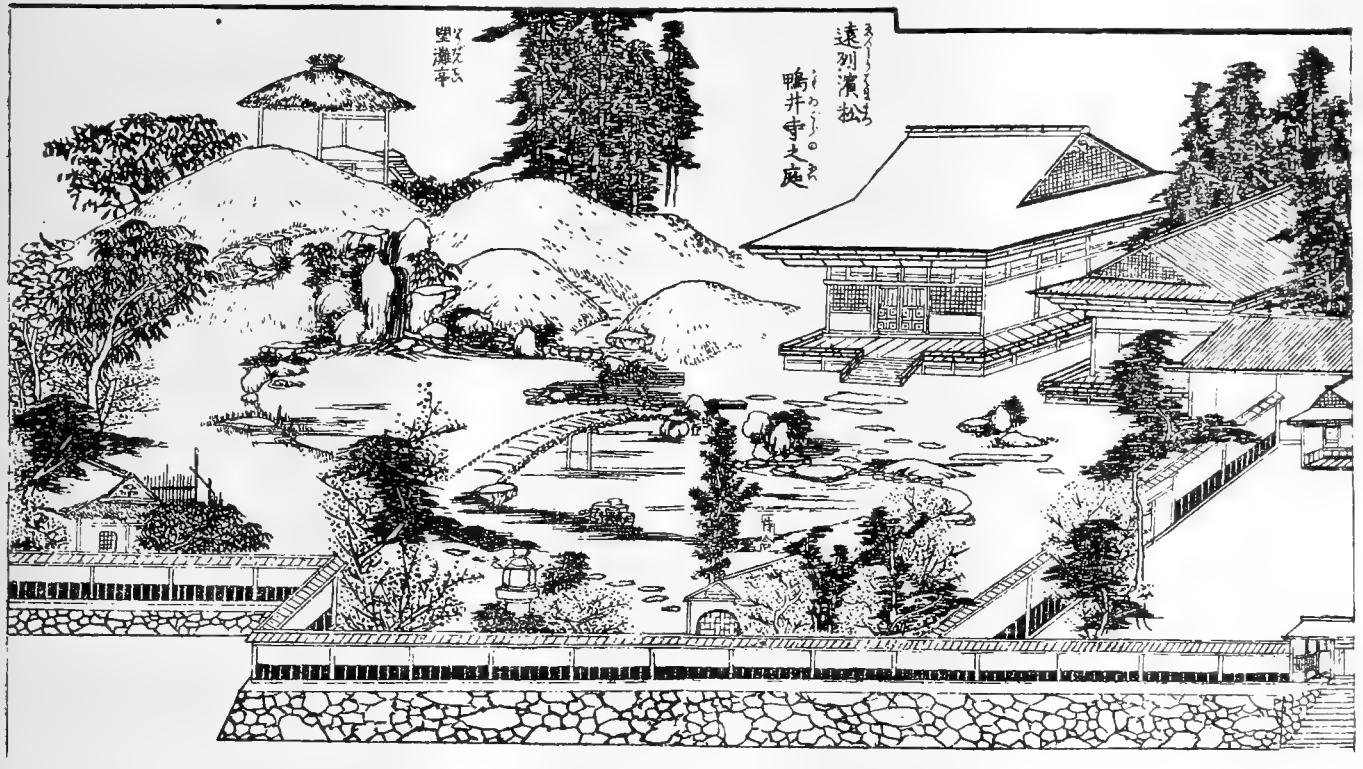


Fig. 27.—A Japanese Garden.—See page 170.

Cultural Department.

A New Disease of the Tomato.

ONE of the greenhouses of the Cornell Experiment Station is devoted to the forcing of Tomatoes, and until the past season the plants have been vigorous and have borne well. But last autumn some of the fruiting plants showed signs of disease; they were weaker, the leaves appeared smaller, and the plants assumed a light green or yellow color. The cause of this change was at first not known, but as the disease progressed it gave evidence of a bacterial nature, and these organisms are now thought to be the cause of the trouble. They are readily found in the tissues of affected plants, and laboratory-cultures develop them in large numbers. We thought that this bacterium might be identical with the one which is sometimes so destructive to Potatoes, for the appearance of the disease in the two plants is similar, but Professor Burril, to whom specimens were referred, has just reported that the two diseases are probably distinct. It is certain that the disease can be communicated to the Potato, for diseased Tomatoes have been grafted upon healthy Potato-plants, and the latter are now plainly affected.

The first indication of the presence of this disease in Tomatoes is shown by the foliage. Small, often vaguely defined

the house, and those nearest to them were the next to show the disease. One plant, standing about fifteen feet from the rest, has remained healthy to the present time. It is quite certain that healthy plants will become diseased if they are set in infested soil, for several have been treated in this manner and all are now affected. One plant had discolored foliage in less than three weeks. Others were set in clean soil and they are healthy, although it is about four weeks since the disease first appeared in the other lot.

The boxes in which the first diseased plants were grown were used again for the next crop, but they were treated in different ways, in order to discover some method of destroying the disease. Some boxes were whitewashed, some were washed with the ammoniacal carbonate of copper, others with lye, and others were set out-of-doors to freeze. All were then placed in the house with clean soil, and young healthy plants were set in them. No beneficial effects of the treatments can be seen, for the plants are all diseased. Spraying with copper compounds has also proved useless. Undoubtedly, all treatment must be preventive and strategic. Care should be exercised in securing clean soil, etc., and the immediate removal of diseased plants may prevent the disease from spreading to any serious extent. Possibly this serious disease is identical with the Southern Blight, recently reported by Dr. Halsted in a bulletin of the Mississippi Experiment Station.

Cornell University.

E. G. Lodeman.

Fameuse and other Canadian Apples.

THE article which follows was prepared for GARDEN AND FOREST by the late Dr. T. Sterry Hunt a few days before his death, and it has been sent to us by his friend, Mr. George Iles:

Apples, we learn from antiquarian examination, were used for food by the prehistoric dwellers in the lake habitations of Switzerland. Early records of western civilization give constant testimony of the value attached to that precious fruit. The influence of soil and climate on the quality of the grape has been very thoroughly investigated, and we have every reason to believe that similar conditions are not less important factors in the cultivation of the Apple, although the subject has scarcely received the attention which it merits from pomologists. For illustration of this we might mention an apple in the St. Lawrence valley, known as the Fameuse, which is greatly prized for its texture and flavor, and commands a high price for exportation. It is worthy of notice that this apple attains its perfection only in certain soils which come from the slopes of the small hills in the St. Lawrence valley, Mount Royal, St. Hilaire and Rigaud. It is in well-drained soils derived from the crumbling volcanic rocks that the Fameuse thrives best. Fruit of this same variety grown on the clay soil of the valleys near by is readily distinguished, alike in flavor and color, from that grown on the more favored soils.

Disregard of the needful conditions has led to many disappointments in the planting of orchards in this region. It is worthy of notice that the Fameuse trees are not quite hardy, and a certain portion of them are destroyed by frost before they attain the age of bearing. A seedling of the Fameuse grown in the upper Mississippi valley, where it has been named the Wealthy, resists the extreme cold of that region and of the Ottawa valley, but this hardiness has been attained at the expense of the flavor of the apple, which in the Fameuse is very delicate. It may be well here to mention some varieties of Canadian apples which have not received the attention they merit:

The St. Lawrence is an apple of rare quality and texture, which was a chance seedling in Montreal—the original tree still stands in Montreal, though mutilated, to make room for building purposes. The Russian Alexander, which is much finer in quality than either of the two Canadian varieties of the Alexander, is also becoming somewhat rare. The Golden Russet and Pomme Grise are small, but of unrivaled flavor and careful preservation till the month of June. The Bourassa, a large reddish russet of extreme beauty and rare quality, originated in the vicinity of Montreal, but is, we fear, lost sight of. All these apples are worthy of careful attention by pomologists.

An interesting fact in relation to the Rhode Island Greening is worth noting. This apple, which, in my boyhood, was a great favorite in eastern New England, seems in late years to have fallen into comparative neglect there, and in some districts its cultivation has been abandoned. I was therefore pleased to find it a few years since in the irrigated soils in the vicinity of Salt Lake, Utah, where this fine apple seems to have recovered the flavor and the texture which made it originally such a favorite in the east.

Violets.

FASHION can never interfere with the popularity of the Violet. Since the introduction of the Parma and Marie Louise forms of the Neapolitan, the type is grown much less than it once was. Though, on the whole, inferior, both from a decorative and commercial point of view, to the newer varieties, it nevertheless has a conspicuous and in some ways superior merit. From my acquaintance I should say it was not quite so early as the others, but is more floriferous and is less liable to disease, and in this way makes up for lack of size and color. Some attempt was recently made to introduce the Parma, so extensively grown for the Paris market, as a rival to the Marie Louise, the general favorite of England and America, but so far without success. The French variety bears abundant lavender-blue flowers, without any trace of purple, and has not the white markings at the base of the centre florets, which, it is contended, is against the Marie Louise. The fact that the latter is not a perfectly double flower, but often comes with a flat, malformed centre, is, I think, an objection of greater weight. The Parma has, moreover, proved more susceptible to both the leaf and root disease than any other variety. Lady Campbell, a blue form of the Neapolitan imported last season, promised, judging from half a dozen plants here, to be a decided acquisition. The

flowers are superior in form to any of this section. The petals are long, and the flower is quite double to the centre. It is recommended as being a continuous and heavy bloomer, which seems probable. Comte de Brazza, the white Neapolitan, a handsome double-flowered variety of good constitution, has not won popular favor. It is nevertheless worn by a few ladies, and highly prized by them for evening dress.

After close comparison between the Russian Violets and the typical *V. odorata*, I have failed to find any considerable structural difference. Certainly the Giant Czar, the most distinct form of the Russian class, does not differ more from the type than does the Neapolitan; and some of the smaller Russian, such as London and Rawson's White, have a very close resemblance. The Giant Czar and its deeper-colored forms, Welliana and Lee's Victoria, are the best of all the single varieties. They force remarkably well, and as many as three crops have been taken out of one house during one season. This necessitates a large stock of plants, which, however, is easy in the case of this variety, as it multiplies rapidly. The plan requires a low, well-lighted house, kept at about fifty-five degrees, Fahrenheit, night temperature. A batch can be forced into bloom and cleared out in six weeks, ready for another crop.

There is a variety of *V. odorata* growing wild in the southern states, particularly in Florida, which is said to have been imported from England. It is probably somewhat changed through acclimatization. The southern variety under cultivation here blooms very early, being at its best during the last three months of the year. Mrs. J. L. Gardiner, of Brookline, Massachusetts, found a form of this southern variety near St. Augustine, Florida, which has been called the St. Augustine, and it well deserves a distinctive title. It is evidently very free from fertile flowers, and blooms profusely the whole winter. The flowers are not large, but abundant and very sweet. The Schonbrun is another variety of *V. odorata*, which has been confounded with the southern one. It is quite hardy here, and after the first few bright days in spring is a perfect sheet of bloom.

There is much diversity of opinion as to the best method of outdoor cultivation for violets. To my knowledge, good Violets have been grown between Raspberries, under Pear-trees, in light soil, clayey soil, with and without manure, and in full sun. My experience has shown that they luxuriate in rich soil, plenty of moisture and full exposure. Some growers take their stock plants in winter, try rooting the runners, which is a good plan when there is danger of disease, but generally old plants are divided into two or three crowns. Until last year I had kept all runners clear off during summer, but I found where a few had been left, when transplanted into the flowering-bed, along with the old plant, they bloomed well, and will make very good plants for outdoors this season.

A multitude of remedies has been suggested for the Violet disease, but few have stood the test of time. There is no doubt that copper sulphates will stay the disease, but even if the plants recover it is not probable that they will yield many flowers. My Violets certainly were healthy last autumn and have remained so, and bloomed well all the winter. When fairly established, I dusted them with a mixture of black sulphur and guano, which was watered in. I also have given them two waterings with manure-drainings; whether or not this has acted as a preventive of the disease I cannot say; it certainly has increased the vigor and healthfulness of the plants.

Wellesley, Mass.

T. D. Hatfield.

The Spring Garden.

NOTHING in nature is more impressive than the annual change from winter to spring. This phenomenon, as old as the world, one never ceases to witness with interest, or to wonder that one clear perfect day of winter should insensibly change in a few hours into an equally perfect day of balmy spring. The atmosphere seems no clearer, the sun shines no more brightly, yet some subtle change has come to earth and air which we at once recognize but cannot describe. If one were otherwise insensible to the change, the myriad small denizens of the fields and woods would by their various shrill noises make the fact quickly known. A few hours, also, will show a great awakening of vegetation, and sometimes, as in the present season, the change is almost as sudden as the revolution from rest to flower, which we read of in the Arctic zone. The first of the present month brought the spring change, which passed as rapidly into an unseasonable summer temperature. This is always somewhat unfortunate from a gardener's point of view. The small early flowers suffer from the great heat and rapidly decline, while the Narcissi, which have been quietly making growth, come

rapidly into too premature bloom without waiting for full development of foliage. In only three days *Narcissus Pseudo-Narcissus* and *N. bicolor præcox* led the van of Daffodils, followed rapidly by *Ard Righ*, the *Tenby*, *Countess of Annesley* and *Scoticus*, in this order. One welcomes the *Narcissi* at any time, however, for from the time of their flowering till the last of the *Chrysanthemums* in November there should be no lack of useful flowers in the garden if it contains a good supply of bulbous plants for the early year. Good early-blooming herbageous plants are not so plentiful, and reliable ones are, in fact, rather scarce and difficult to maintain in this latitude with its vicissitude of frosts and thaws. *Rock-cress* is one of the few satisfactory things flowering just now. The first of the hardy *Primulas* are just opening, and, of course, *Bellis perennis* expands with the first warmth. The *Hellebores* also are apt to give some flowers now—my garden not being one of those fortunate ones where the Christmas Roses flower amid ice and snow, as so beautifully figured in the catalogues. Some *Snowdrops* are still in full beauty, making a season of five months of this charming flower.

This is a good time to arrange for a water-garden if not already provided for. No feature of gardening is more satisfactory and enjoyable, and no garden should be without some arrangements for growing water-loving plants. If *Nymphæas* are grown it is necessary to remember that the tank should be an aquarium, so that it be properly stocked with fish as well as plants. My tank contains only 150 cubic feet of water, and is only twenty inches deep, so that when the hardy *Nymphæas* were left in last winter, some with crowns within six inches of the surface, it was with considerable doubt as to their safety. The tank was covered with a layer of boards, and a thin covering of leaves over these. There seemed to have been not over two inches of ice at any time during the winter, and with more leaves there would probably have been none. The *Nymphæas*, *Sagittarias*, *Limnocharis* and *Aponogeton* came through the ordeal safely, and only need a replanting in boxes and a little warmth to start them into full growth. Some of the *Nymphæas* start up very quickly. A large plant of *N. chromatella*, which was wintered in the cellar and was entirely dormant, woke up in three days when placed in a pail of water in the greenhouse at sixty degrees. There seems to be no difficulty in wintering hardy *Nymphæas*, and the tender ones after they have made tubers, but some varieties, like *N. Zanzibarensis*, are very unreliable keepers with most growers, and it is to be hoped that some one will explain how they may be wintered with certainty when they have not formed tubers. In my small experience a check from leaving them out too late, or a low temperature at any time, seem fatalities from which they do not recover.

Elizabeth, N. J.

J. N. G.

The Water-garden.

AFTER months of anxious waiting April is a busy time in the water-garden, and this year in particular, when severe January weather followed hard after a few softly beautiful days in March, one cannot help feeling some excitement as the covering is cleared away and the effect of the winter upon some water-plants of suspected hardness is examined. This clearing away of all litter is the first thing to be done in water-gardens north of New York, where the tanks have had a covering, and in many cases where the water is deep, it will be necessary to draw off some of it, so that the plants can be more readily examined. In the neighborhood of New York I have not yet heard of any *Water-lilies* perishing on account of the hard winter. *Marliac's* yellow *Nymphæa* has already made large growth as compared with our native *Pond Lily*, and the *Nelumbiums*—*N. speciosum*, *N. nuciferum* and *N. luteum*—are also showing growth above the soil. Little difference can be seen between these *Nelumbiums* wintered under water and those with the water drawn off and covered with leaves and litter alone. Some persons find difficulty in establishing *N. speciosum*, the *Egyptian Lotus*, and the plant deserves attention at once. If tanks are to be built, the work must be pushed. In tanks already in use, the water should be drained off and a top-dressing of rich compost should be given. If this compost was prepared last season of turfy loam and thoroughly decomposed manure, in equal portions, it will be all the better. The compost to the depth of three inches may be placed directly upon the accumulation of dead leaves, where there is any, and upon it should be spread a dressing of clean sand.

If fresh roots are to be planted and the tanks are not ready or the weather is yet too cold, it will help a great deal if the plants are started in tubs, where they can be sheltered in excessively cold spells, to be planted out when settled warm

weather comes and growth is active. Dormant roots should not be set in deep water, nor should growing plants have their leaves submerged. Roots dormant or just starting should be placed in tanks and covered with about six inches of water, which should be gradually raised as the plants advance. If it is desirable to set them in ponds or lakes, half-established plants may be placed near the edge, where they will be but a few inches deeper in water than where they were grown before. They require but gentle pressing in the mud, but where they show any tendency to rise a few bricks or stones will keep the roots in position until they take hold of the soil. Detective duty against musk-rats should be unceasing, for should these animals once get a taste of the plants they are doomed, and the same is true of *Nymphæas*. I am also of the opinion that turtles eat the buds of *Nymphæas*, and just now I am keeping them under close watch until convinced of their friendliness. Where the hardy *Nymphæas* need to be thinned out this work should be attended to at once and top-dressing should be given them, as has been recommended for the *Lotus*. Where new plants of *Water-lilies* are to be set in a tank they should have at first no more than six inches of water, until a stronger growth makes need for more.

Dongan Hills, N. Y.

Wm. Tricker.

Primula Sieboldi.

THESE Japanese Primroses deserve a wider cultivation than they now enjoy. They are easily grown, soon form large clumps, have handsome foliage, flower freely, and are in full beauty from the middle of April to the middle of May, when there are not many flowers of any kind to be had. Since they flower so early, it is better to plant them in sheltered nooks, where they will be protected from cold winds, or to keep a temporary frame over them from the time they begin to grow till the bloom is over. Give air at all times during the day and mild nights, and take the lights off on calm days. This little extra trouble is well repaid by larger flowers of a brighter color, produced a week or fortnight earlier. A fairly light soil, well enriched with decayed leaf-mold or stable-manure, is well suited for their culture, but is not essential. I have seen these Primroses flourishing in full sun and in partial shade, but they last longer in beauty in the shade. A top-dressing of well-decayed leaf-mold or soil should be given in the fall, as the crowns are often above the soil when the plants have done growing. When hard frost sets in a slight covering can be given of boughs, with some litter thrown on the top (so that the litter does not rest heavily on the soil), or a temporary frame covered with a wooden shutter or boards can be used. Protection from frost is not necessary unless the winters are very severe or on soils where plants are much lifted by frost. The covering should be taken off as soon as frost is out of the soil, and where a frame is used a light can be put on.

The following varieties are distinct: *P. Sieboldi*, the type, has large umbels of bright magenta flowers with light centre; *Intermedia*, improved, has bright reddish crimson flowers in large umbels, freely produced; *Lilacina* has large fringed flowers, lilac, feathered with white, and light centre; *Lilacina marginata* has bold flowers, nearly as large as a dollar, with petals overlapping, the exterior of the flower light slate, the interior white, margined and slightly feathered with lilac; *Magenta Queen* has large dense umbels of clear magenta flowers, slightly fringed, and is one of the first to flower; *Rosea alba* bears abundantly flowers whose exterior is light, interior white; *Rosea striata*, flowers light lilac, shaded and striped; *Violacea*, flowers reddish violet, borne freely in rather loose umbels.

Norwood, Mass.

Charles H. Rea.

Correspondence.

Mid-March in Northern California.

To the Editor of GARDEN AND FOREST:

Sir,—After an unusually mild winter there came in late February a series of clear warm days, with pleasant nights and a midday temperature which rose to eighty degrees in the shade. This continued for three weeks, and its effect on an already advanced vegetation may well be imagined. *Narcissi* were in blossom by the middle of February, and are now (April 1st) nearly gone, and so are *Hyacinths*. Early *Tulips* are well along; *Violets*, *Primroses*, *Verbenas*, and the whole line of spring flowers are in the full tide of bloom. *Rose-bushes* are a mass of buds, and in sheltered positions a few are in flower. At San Francisco, *Callas* and *Roses* are in full bloom, *Japan Quinces* have come and gone, *Laurustinus* and *Photinias* in

bloom, and the Persian Lilac nearly so. I saw the beautiful St. Bridget Anemones in full blossom over a month ago. Self-sown plants of Drummond Phlox are now in blossom. A striking feature of the spring blooms in California are some of the Australian Acacia-trees. Common here is *A. molissima*, specimens of which a month ago were great masses of yellow bloom, scenting the air for blocks around.

Wild flowers are over a month ahead of time. In February the Manzanitas were in full flower. These bushes are a feature of our scenery, growing in uplands and mountains in large dense masses, and this year they made an unusual display. *Ceanothus divaricatus*, very common in the chapparal growth, is now white with blossoms, and the Madroña is in bloom at this very early date, although May is nearer its proper season. In the open fields our common Buttercup is flowering in masses, and *Nemophilas* common. *Castilleja parviflora*, a dark red Painted Cup, is plentiful in the woodland. Everywhere the bright yellow flowers of *Calandrinia* can be seen peeping through the grass. Of *Erodiums* two species are very common here, and their pink flowers are everywhere. Within a week I have seen some flowers of our state emblem, the *Eschscholtzia*, or California Poppy. There is a second species of *Ranunculus* now blossoming plentifully in wet lands. In leaf and root it very closely resembles the garden varieties, but the flowers are yellow. *Oenothera ovata*, one of the sessile species, is flowering abundantly. The seed-pods of this species are formed several inches below the ground-level. I have seen several blooming plants of the Scarlet Larkspur, and a large plant of this in a wild bed is one of the prettiest things I have in flower now. In a cool situation and loose rich soil, few plants will give better satisfaction. In rock-work it is perfectly at home, and cliffs all aglow with its flowers are among the brightest Californian scenes.

One of the prettiest early flowers is *Mimulus Douglasii*, a tiny annual with a flower nearly two inches long. In my garden the native bulbs are unusually precocious. The first to bloom was *Scoliopus Bigelowii*, which was full of bloom at Christmas, and in a spot where it scarcely received the sun at all. The numerous flowers are produced on slender scapes, and are lined with brown and purple—more odd than pretty. The leaves, which at blooming are quite small, develop later till they are five or six inches long by two to three broad. The *Trilliums*—*T. sessile*, var. *Californicum*, and *T. ovatum*—were in blossom very early. The first is truly a beautiful plant. A specimen at hand shows petals three inches long, with the leaf five inches across. With us the petals are white, with more or less purple in the throat. Near San Francisco all range from rose-color to purple. I have never seen one here of a rose or purple color until this season. A plant which last year was pure white, but which stands where it did, under the shade of a Cypress-hedge, and is never reached by the sun, is now rose-purple. It is common for this species to throw up several stalks from one root, making a fine clump. *T. ovatum* is pure white, and very near to the eastern *T. grandiflorum*.

I bloomed three *Erythroniums* this season. *E. grandiflorum* (*E. giganteum*, according to Mr. Watson's revision of the genus published last spring) is a very free bloomer and easily grown. I find shade necessary to secure the finest flowers. This season I had a bed of *E. Hartwegii*, a rather rare species. The flowers are much the same as those of *E. giganteum*, but instead of being in a raceme each is borne on a slender scape, giving a very pretty effect. Smith's variety of *E. grandiflorum* is always beautiful in flower, but one could wish its blooms were borne more abundantly. As far as I have seen, it is a strictly one-flowered species. It is at first pure white, becoming rose-colored. A soil composed of equal parts of chip, or leaf-mold, and sand suits these *Erythroniums* perfectly; and if planted in a sunny position, the shade of a lath-frame or cloth sash will bring out the flowers in fine shape.

The *Fritillarias* have all done well in a loose soil of sand and mold. I blossomed a rather striking variety of *F. lanceolata* this season called *Gracilis*. The blossoms are more open than in the type, and the segments acuminate. It is very dark, many of the blossoms being nearly black. Held to the light it shows wonderfully rich colorings in dark red and purple. *F. biflora* is a species which takes especially well to cultivation, thriving in any loose rich soil and blossoming freely. The blossom, unlike those of most *Fritillarias*, is not mottled, but the coloring is in fine lines. But of the Californian *Fritillarias* none approach *F. recurva*, some specimens of which have borne thirty-five of its scarlet blossoms to the stalk, and are worthy to be compared with the Lilies for beauty.

But one *Brodiaea* is in blossom so far, the violet-headed one. Nearly all are budded at this very early date. Last year I gave the readers of GARDEN AND FOREST my methods of growing

Calochortus. We learn by experiment, and last year taught me one valuable lesson. I had been giving *C. venustus* ocular rather good loose soil, but one lot was planted in a poor yellow clay loam, a soil that baked like a brick. That lot excelled all others, giving fine stalks, large flowers and perfecting large bulbs. This season all my plants of that variety are in a clay loam, sifted, and I have never seen a finer growth. The same treatment should apply to all the varieties of *C. venustus* and to *C. luteus* and *C. splendens*. In richer soil I find the bulbs do not ripen in a healthy way.

Ukiah, Cal.

Carl Purdy.

Notes on Grafting.—III.

To the Editor of GARDEN AND FOREST :

Sir,—It has been shown that for successful grafting a sufficient number of cions should be set to sustain a free circulation of sap and to keep all sides of the stump alive. The grafts, cut in February or March, and kept in moist earth in a cellar, should not be set until growth begins in spring and buds are bursting. The waxing of all cut surfaces, clefts and abrasions must be complete, and for this purpose liquid wax is preferable. To make this, take, say, one pound of rosin, one-fourth pound beeswax, one gill linseed-oil. Melt these together and mix. The wax should be of such temper that when cold it will be hard, yet tough—that is, not liable to fracture, as will pure rosin. It may be tested for use by dropping some of the melted wax on a chip and letting it cool. If it then prove too soft, add a little more rosin; if too hard, a very little more oil. The wax may be kept in a small iron kettle.

After setting, say, fifty grafts, warm the wax until liquid, but not scalding hot, and apply with a small paddle or a cheap paint-brush. Cover all wounds and the upper ends of the cions. It is a simple thing to shave a graft's lower end like a wedge and stick this into the cleft in the stock so that the inner barks of graft and stock may meet. If carefully waxed it will almost surely grow. I have set a thousand grafts a day, not using any especial care, except in the waxing, and had every graft grow. In my Pear-orchard are grafts which I set by simply driving a quarter-inch chisel slanting downward into the side of a limb and driving a wedge-shaped cion into the opening made by the chisel as one would drive in a peg, and then waxing. After a year's growth of the graft the limb can be sawed off above it in May or June, sloping downward behind the graft. The cut surface, if waxed or painted, will soon heal over. I have grafted Grape-vines successfully by boring a hole downward in the stock with a bit slightly smaller than the cion; then driving this into the hole as a peg, far enough for bark of graft and stock to join. Cover with moist earth, or, if high on the stock, with wax. After the graft has started saw off the vine.

Thousands of Apple and Pear-trees have been planted which have been grown from grafts set in root-cuttings, or from grafts or buds set upon the sprouts which spring up from the lateral roots of orchard trees where these roots have been torn by deep cultivation. Around a tree disposed to send up these sprouts from its lateral roots may be found several hundred of such growths springing up over a circle, say, twenty feet in diameter.

When there was large demand for nursery stock, and it was useful to have grafted trees as soon as possible, on account of the money they would bring, I have seen nurserymen's agents grafting or budding these root-sprouts by wholesale. Next year they were dug, separated, planted into nursery-rows and soon marketed as "grafted stocks."

Trees thus grown from the lateral roots of the parent tree are apt to be only superficially rooted; they will never have tap-roots penetrating deeply into the subsoil, but will stand flat-footed on top of the ground. They are apt to be injured by winds and droughts and cannot be durable, because they lack a good foundation. These defective trees may be known in the orchard by their tendency to throw up sprouts from their roots.

Sometimes trees in the orchard are damaged by sunscald on the southerly exposure of their trunks. Many of my grafted Apple, Pear and Cherry-trees have succumbed to this injury. On uprooting them I have found them all flat-footed, having no tap-roots. This observation led me to examine the roots of those trees that had escaped this damage, standing in the same orchard and subject to the same conditions. These trees all had tap-roots reaching deeply into moist soil, and thus sustaining vitality during intense surface-droughts.

The teaching of this is to plant only trees grafted on seedling stocks. The seedling naturally develops a tap-root and tends to renew it when it is cut off. A tap-root will never

start from a cutting, a layer or a cutting of a lateral root. This is exemplified in the root-system of Grape-vines which are grown from cuttings. These have their one or two tiers of lateral roots, starting from the buried nodes of the cutting. Thousands of vines have been extirpated in vineyards in south Jersey, and no one ever saw a vine with roots much deeper than the foot of the cutting. On the other hand, I have Grape-vines, grown from seed, with roots penetrating straight downward six or eight feet.

The occasional failure of grafted trees may be explained by this fundamental defect in their root-system. The grafts have been worked upon root-cuttings or root-sprouts. There is no reason why a graft properly founded upon a seedling stock should not be as vital and durable as if the entire tree had grown from the seed.

To have a naturally durable orchard, plant the seed where the tree is to stand and graft it there.

Vineland, N. J.

A. W. Pearson.

Impressions of Leaves.

To the Editor of GARDEN AND FOREST :

Sir,—Many years ago, after seeing some rather indifferent impressions of leaves, taken by means of a pad saturated with coloring matter, it occurred to me to try what could be done in the same line with common printers' ink. The result proved to be much better than was expected. Where the leaf was not too rigid, and had a tolerably flat surface, the impression was not only distinct in outline and venation, but showed the peculiarities of the surfaces of the different Oak-leaves, for example, so clearly that it was quite as easy to distinguish the species from the prints as from the leaves themselves.

Not only could ordinary leaves, like those of the Oaks and Maples, be printed in this way, but many very delicate Ferns, with a little care, were beautifully delineated, as will be seen by the samples I send you. The Oak-leaves were printed some thirty years ago, and the Ferns about twelve years later.

The process was very simple, and I will give it, as it may be both interesting and useful to some of the younger readers of GARDEN AND FOREST, should they be inclined to try it. They will have an enduring reproduction from actual life, which is always ready to be used for study or comparison.

With a small round dabber, like an old-fashioned pincushion, made by stuffing cotton in the hand part of an old glove, the ink is tapped on the side of the leaf to be printed. To apply it evenly the ink should be rubbed with the dabber smoothly over the surface of a plate or flat piece of glass. When every part of the leaf has been inked it is laid on the paper and the two pressed together by placing them in a magazine or letter-book, and using an ordinary copying-press or any other means of applying a strong even pressure.

Where the leaf is firm, as in the Oaks and Maples, the same leaf may be used several times in succession, and often with the result of obtaining a better impression, and if desired several leaves may be printed on the same sheet at one time.

Santa Barbara, Cal.

Hugh D. Vail.

[The impressions which accompanied this letter are beautifully distinct and uniform. They were taken on heavy smooth-surfaced writing paper.—ED.]

Recent Publications.

The Rescue of an Old Place. By Mary Caroline Robbins. Houghton, Mifflin & Company, Boston and New York. 1892.

To most readers of GARDEN AND FOREST this book will need neither introduction nor recommendation, for it is practically a reprint of the series of articles which, under the title "How We Renewed an Old Place," appeared in these columns during the past year and achieved a conspicuous success.

We are tempted, however, to speak somewhat at length of the volume for the benefit of new subscribers and to refresh the memory of older ones, for even those who are familiar with its contents should be reminded that a good piece of work appears to better advantage in book-form than when scattered through the columns of a periodical. Moreover, Mrs. Robbins' chapters have a practical as well as a literary value, and they will be more easily referred to when collected into this pretty little book.

A very pretty little book it is, with a simple but artistic cover of gray muslin printed in silver, and with good paper, attractive type and generous margins, which give room for a useful running index of the contents. Mrs. Robbins has now prefaced each chapter with selections from poets, old and new, and they are chosen with so much taste and feeling that, as

we pass from chapter to chapter, they put us in just the right mood for the pages which are next to come. One of these quotations, by the way, we cannot refrain from reproducing, for it gives an interesting proof of the analogy in mood and even in expression which may exist between poets very widely separated in time and nationality. This stanza runs :

All the fields which thou dost see,
All the plants belong to thee ;
All that summer hours produce,
Fertile made with early juice,
Man for thee doth sow and plow,
Farmer he, and landlord thou !

Does it not sound like a veritable bit of Emerson ? But it was written by one Anacreon, whom we are apt to think of as a very different sort of person. There is only one feature in the make-up of the volume which might be criticised. In a journal like this, specially devoted to plants and their uses, or in a scientific work of which they are the subject, it is fitting that even their common names should be printed with capital letters. But it is open to question whether this somewhat technical precedent should have been followed when the essays, with their distinctive literary as well as technical value, are cast into book-form for general readers.

We shall not dwell upon the practical value of Mrs. Robbins' record of her successes and failures as a designer and gardener, since this will be quickly discovered by all who feel the need of help or sympathy in similar labors. It is even pleasanter to speak of the literary charm of the book, which seems to us not only high in character, but individual in kind.

Our readers have often been told that delightful writing about nature seems the birthright of New Englanders, and have often had their attention called to one book or another which treats of wild nature in some peculiarly attractive way. On the other hand, we are familiar also with books entitled to rank as literature which recite in a gently humorous manner the trials and triumphs of the amateur gardener—books, among which Mr. Warner's *My Summer in a Garden* holds a leading place. But in Mrs. Robbins' book we find an intermingling of many different moods, a constant change from one point of view to another, a condensation of all the varied experiences and emotions that long, busy, and yet contemplative summers and winters in the country can bring, which, we think, gives it a distinct and most attractive individuality. Her observations are not confined to the acres of the old place there. They extend over the beautiful landscapes which lie around them, and include the whole realm of nature, as it has come before her eyes and impressed itself upon her memory. Man's aims and their results are her nominal theme ; but the works of God as a whole, and their influence upon the human soul, is the subject which really occupies her. And it is as surprising as it is delightful to see how she weaves the personal and the general, the practical, the æsthetic and the poetic into the woof of her chapters, so that a discordant note is never felt, and the picture left upon our minds of that corner of the world which she inhabits is as broad in general effect as it is distinct in detail, while the central figures, herself and the companion whose presence we always feel, soon become well-known and pleasant friends. Of course, mere literary skill would not accomplish so much as this. Behind the graceful mastery of word and phrase there lies a sensitive eye, a keen and cultivated mind, a spirit that responds to every poetic suggestion in books or nature, and a sense of humor much more quick and hearty than is often combined with these other qualities. The greatest charm of the book, we have said, is its variety, woven into a harmonious whole. And this variety exhibits itself not only in the themes touched upon, but in the moods through which they are viewed. One never knows in turning a page whether the next sentence will be prettily poetic or instinct with a true sentiment that never degenerates into sentimentality, or whether it will make us laugh instead of smile. The contrast between such a chapter as the one in which are chronicled the web-worm and his devastations and the one entitled "Suggestions of the Waning Year" is very great, and yet it is contrast merely, not discord ; and this is due to the fact that the author seems less to change from one mood to another than to dwell in many almost simultaneously, as finely susceptible minds are able to do. Her most humorous passages are restrained by an underlying seriousness of feeling, and her most reflective ones are enlivened by flashes of humor.

Of course, writing of this sort cannot be described in writing of another sort, and even lavish quotations would not do it justice. We can only say, therefore, that while the *Rescue of an Old Place* will be found useful reading by many persons, it will be found very delightful reading by all who, whether they have acres of their own or not, can sympathize with the expe-

riences of an intelligent and susceptible mind in the presence of nature, or can enjoy really good and graceful writing upon any subject. And the true lover of nature and books will be glad to put this new-comer upon his favorite shelf, whether its row of big volumes and small begins with Evelyn or only with Thoreau.

Notes.

The Spice-bush is already brightening the brook-sides near this city with its abundant yellow flowers.

The best varieties of Sweet Corn are comparatively late. It is well, however, to plant a little of the hardier kinds for extra early use, but we have not yet tried any of these varieties which are satisfactory as to quality.

The Peabody Museum of Archæology announces that the Serpent Mound Park, in Ohio, established to preserve the most interesting of our prehistoric relics from destruction, has been completed, and that the discriminate cutting of timber from parts of the land, together with the sale of the hay-crop, will assist in defraying the expenses of its maintenance.

At the late Philadelphia flower-show some specimens of *Ficus elastica*, which were exhibited by Mr. W. K. Harris, attracted much attention from their bushy habit. Usually, this plant is grown with a single stem, but Mr. Harris' plants branched out at different points along the central stem, so as to present a tree-like appearance. Ordinarily, this branching habit is brought about by cutting off the main stem, but in these plants the branches seem to have been forced out by some cultural device.

The last number of *Meehans' Monthly* has a word of praise for our native Bird's Foot Violet (*Viola pedata*), which is spoken of as one of the handsomest of the family for garden purposes. Not only does it thrive well in borders, but it seems capable of furnishing a great number of beautiful forms, as it grows wild in different colors—white, rose-color and the like. There seems to be no reason why, with some care and selection, it might not furnish as many varieties as the Pansy has. Among some of these Violets, indeed, there are forms now which have a striking resemblance to Pansies with their two upper petals dark crimson and the three lower ones of a violet-blue.

Rev. G. H. Engleheart writes in a recent number of the *Gardeners' Magazine* of *Iris Bakeriana*, that it flowers almost as early as *Crocus Imperati* and about the same time that the most beautiful of the Grape Hyacinths (*Muscari azureum*) appears. It is somewhat expensive, but an excellent example of the paradox that high-priced goods are often the cheapest. Two years ago Mr. Engleheart invested three shillings and sixpence in a not very promising-looking bulb of *Iris Bakeriana* in a tiny thumb-pot. This was turned out into his border, and the next February it gave him one fine flower, which the year after increased to seven, each flower representing a bulb, and now, in its third season, it has formed a fine clump.

Mr. Theodore L. Mead writes to the *Florida Agriculturist* that at his place in Orange County, Florida, *Dendrobium nobile* has proved practically hardy. Some plants on the trunk of a Palmetto have been out three winters and have endured a temperature of twenty-five degrees several times, and once still lower, with very little injury. Sharp frost in January of this year cut off one half-grown shoot, but did not injure another alongside of it, nor did it hurt the old pseudo-bulbs or young flower-buds just opening. This frost cut down large Guava-bushes to the ground, and many of the tenderer *Phoenixes* lost all their leaves. Besides the *Dendrobiums* on the Palmetto, he has others in the woods, both on the ground and on tree-trunks, and these were untouched.

At a meeting of the fruit-growers of Ontario two apples were exhibited which were the result of a careful cross-fertilization by Mr. P. C. Dempsey, between the Golden Russet and the Northern Spy. The first of these, No. 90, was specially commended by the Fruit Committee for appearance, solidity, flavor and keeping quality. It seems an almost perfect apple for export, not too large, of a clear dark-red color, such as the foreign market demands, and its very solid flesh enables it to be packed firmly and carried well. The apple, No. 87, is rather later, and does not reach its best quality till after New Year's. It is larger, and quite as well colored and beautiful. Both of these apples have very small cores. The fact that they are not chance seedlings, but have been produced by careful selection from parents of known qualities, is certainly an encouragement for those who are devoting them-

selves in a studious way to the production of new fruits by careful breeding.

"Experiments by Herr Regel," says a recent article in the *Popular Science Monthly*, "with reference to the influence of external factors on the odors of plants, show that the most important is the indirect influence of light on the formation of etheric oils and their evaporation. Heat and light intensify the fragrance of strongly fragrant flowers, which in darkness is lessened without quite disappearing. When the whole plant was darkened those buds only which before were fairly well developed yielded fragrant flowers; the others were scentless. If, however, only the flowers were darkened, all were fragrant. Other plants open their flowers and are fragrant only by night. When these plants were kept continuously in the dark they lost their scent as they lost their starch. When brought into the light again both starch and fragrance returned. Besides light, respiration has a decided influence on the fragrance. In general, the opening of flowers coincides with their fragrance, but there is no necessary connection between these phenomena."

From some experiments with nitrogenous fertilizers on pasture-fields made at the Storrs School Experiment Station, in Connecticut, it appears that fertilizers containing potash or phosphoric acid alone are less effective for grass than if they have some available nitrogen in addition. The grasses, such as Timothy, Red Top and the like, must be classed as "nitrogen consumers," while Clover and the legumes are now called "nitrogen gatherers," since it seems to be accepted that in some way they gather nitrogen from the air. It would seem desirable, therefore, that fertilizers for pasture, grass-lands and lawns should contain a considerable quantity of nitrogen in a readily available form. Such fertilizers not only increase the total yield of grass, but they also increase the percentage of protein in the crop. Since it is protein which makes blood, bone, muscle and milk, and as this is the most important and costly ingredient in food and apt also to be deficient in feeding-stuffs, the increase of this substance is a matter worthy of consideration and a strong additional argument for the use of nitrogenous fertilizers.

F. R. Pierson writes to the *American Florist* that Bermuda Easter Lilies are often left too long after they are ready to be cut. The proper plan is to cut the flowers as soon as they are sufficiently open to allow the pollen to be removed, to put them in water and set them away in a dark cellar. The flowers will then never become transparent or papery, but have the desirable waxen appearance which gives them their highest value. Of course, this refers principally to the smaller-sized Lilies grown for cutting, on which there are from two to four flowers on a stem. It will be found that when the first Lilies begin to open on the stem, if they are cut and treated in this way, the remaining buds will open even better in the water than they will if they remain in the greenhouse, while the first flowers will keep in better condition than if they had remained in the heat and sunshine until the other flowers had opened. Potted plants should also be placed in a darkened greenhouse, a cool shed or a cellar when their flowers are opening. For transportation the flowers should be packed with a little cotton as tightly as possible, and they should be absolutely dry, because the least moisture will discolor them. Lilies properly cut can be kept for a fortnight without injury if they are in a place where there is no condensation of moisture. When they show any sign of flabbiness they should be removed from the jars and the stems freshly cut, and they will shortly be as good as ever. On arrival at their destination, after a long shipment, they should have their stems cut and be placed in water in a dark cellar for half a day before using, and they will be greatly improved.

Catalogues Received.

B. A. ELLIOTT & Co., 54 Sixth Street, Pittsburgh, Pa.; Seeds, Trees, Shrubs and Small Fruits. "A Few Flowers Worthy of General Culture," an Illustrated Treatise on the Practical Advantages of Hardy Flowers as Garden Plants, with Price-catalogue.—JESSAMINE GARDENS, Jessamine, Florida; Rare Florida Flowers and Fruits, Ornamental Plants.—JOHN LAING & SONS, The Nurseries, Forest Hill, London, S. E.; Special Clivia List.—JOHN A. SCOLLAY, 74, 76 Myrtle Avenue, Brooklyn, N. Y.; Horticultural Building and Hot Water Engineering.—JOHN C. TEAS, Carthage, Mo.; Shade and Ornamental Trees, Evergreens, Fruit Trees, Grapes and Small Fruits.—THE TOTTENHAM NURSERIES, Ld., Dedemsvaart, near Zwolle, Netherlands; Wholesale Trade-list of Conifers, Rhododendrons, Azaleas, Roses, Fruit Trees, Perennials, etc.—VILMORIN ANDRIEUX ET CIE, Paris, France; Seeds of Trees, Shrubs and Greenhouse Plants.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLES:—Yellowstone Park	181
The Utility of Beauty.....	181
Notes of a Summer Journey in Europe.—XII.....	J. G. Jack. 182
Plantains.....	183
The Forests of Lower California. (With figures.).....	C. R. Orcutt. 183
PLANT NOTES:—Some Recent Portraits.....	184
NEW OR LITTLE-KNOWN PLANTS:—A New Strain of Roses.....	J. N. Gerard. 184
FOREIGN CORRESPONDENCE:—London Letter.....	W. Watson. 184
CULTURAL DEPARTMENT:—The Best Garden Strawberries.....	O. W. Blacknall. 186
Phajus grandifolius in a Window-garden.....	Mrs. Danske Dandridge. 186
Flower Notes.....	T. D. H. 187
Narcissus Bulbocodium.....	O. O. 188
Permanent Narcissus Beds.....	O. 188
Growing Plants in Moss.....	Wm. F. Bassett. 188
Papyrus Antiquorum, Begonia Triomphe de Lemoine, Corydalis bulbosa.....	J. N. G. 188
CORRESPONDENCE:—The Northern Limit of Sabal Palmetto.....	Professor W. F. Massey. 189
A Plea for Warm Tints in House-painting.....	Mrs. J. H. Robbins. 189
Sweet Peas.....	R. A. 190
Sand Dunes.....	Charles L. Mann, B. E. Fernow. 190
RECENT PUBLICATIONS.....	190
NOTES.....	190
ILLUSTRATIONS:—Pinus Jeffreyi, var. peninsularis, Fig. 28.....	185
A Pine Forest in Lower California, Fig. 29.....	187

The Yellowstone Park.

THE men and women who take an intelligent and active interest in Yellowstone Park are comparatively few, widely scattered throughout the country and not organized for any united aggressive or defensive policy. Here and there a far-sighted man appreciates the immense value which such a reservation will be to the country in the future, and there are a few enthusiastic tourists who have camped in and around it and have acquired a genuine affection for the place, but the great body of our citizens very naturally are absorbed in interests which are nearer home, and they have little time or energy or thought left after their daily labors for anything so remote from their present and personal interests. One would think the Congressmen of the country, whose duty it is to look after the affairs of the nation, would give studious attention to the great reservations of public land which belong to the people which they represent. But they, too, are engrossed with other matters which are of immediate importance to themselves or to their constituents, so that the parks and public forests receive a small fraction of their attention.

There is a small group of men, however, whose interest in the Yellowstone Park never sleeps, for it is an interest born not of public spirit, but of selfishness. This is the partnership whose lobby is working now, as it has done in the last Congress and the one before, to confiscate a portion of the park for private use. It is not a scheme to provide railway facilities for any particular section; it is a scheme to allow no railroad but one through the park, and then to control the franchise. Of course, this project is utterly bad, against public policy generally and against the interests of the park particularly. It has been opposed by every Secretary of the Interior for eight years past, and by every one else who has any genuine interest in the park. The best-informed observers believe that it is primarily a job to get from Congress something which can be sold for cash.

This year, instead of loading the bill to establish the boundaries of the park with a rider, the lobby has introduced a separate bill asking for a right of way through it. A majority of the Committee on Public Lands in the House has been secured, and the bill has been reported favorably. And yet this park belongs to the nation, and not to this set of railroad speculators. Every man in the country is part-owner of it; every man has a right to the protection of his own property, and every man should in some way make a vigorous protest against this condemnation of public property to private use. It is, therefore, the duty of every one who reads this article to write at once to his representative and request him to see that this measure is stopped where it is.

Besides this Montana Mineral Railway job, there has been reported in the Senate a bill which cuts off about one-half of the forest-reservation which adjoins the park on the east, and also cuts off the south-west corner of the reservation on the south. It will be remembered that this reservation was set apart by a proclamation of the President under the power granted to him a year ago, and Congress is now considering a measure to enlarge the park so as to include this reservation. This bill is nominally in the interest of the people of Wyoming, who wish to retain control of this forest, but really the people of Wyoming have greater interest in preserving this forest than any other people of the United States, for it will insure the preservation of a forest which will almost certainly be destroyed if the national protection is removed from it. A most serious mistake is that of cutting off the south-west corner of the forest, which is done, as it appears, in the interest of railway corporations, simply because they think they may some day want to pass that way. No survey has been made, and probably there will never be any occasion for going through this region. If any such railway line were needed it would be much easier and better to pass on the south side of the Tetons than to go around on the north side. Of course, the mining-prospectors and timber-gatherers have an interest in reducing the reservation, but experts declare that there are no mining properties of any serious value in this portion of the reservation which it is desired to hand over to destruction.

It is high time that the whole country should be aroused to face this matter as it stands. Here are two bills favorably reported, both of which are inexcusably bad. No railway franchise should be allowed within the park under any condition, and this particular one is essentially vicious all the way through. The whittling down of the forest-reservation is another serious attack on public rights which should be strenuously opposed. Instead of diminishing this area, other reservations should be established as rapidly as they can be intelligently located and their boundaries judiciously determined. The time will come when a broad and strong current of public opinion will hold Congress to its duties in this direction, but until then it is the duty of every one to appeal to his representative and to any other member of Congress with whom he may have influence to protect from spoliation these few isolated remnants of our great forest-domain which by a fortunate chance have been set apart to be held forever as public property. In this way alone can their permanent safety be assured.

For nearly a month the proposed speedway in Central Park has been a topic for animated discussion in the newspapers of this city, and the writers for the press, called upon to give a reason for the faith that was in them, have found it necessary to pay studious attention to many of the problems in the design, construction, maintenance and management of public parks. We have often called attention to the vague and inconsistent views as to the true functions of city parks which are held even by intelligent persons, and therefore this discussion of first principles has had a genuine educational value in the clearing away of misconceptions. Only a few years ago the President of

the Park Board in this city attempted to justify a project of his to fill up with carpenter-work one of the fairest dells of the park by calling the spot "a piece of unimproved ground," and it seems to be a prevalent opinion that land which cannot be driven over or trampled on or covered with structures of some kind can serve no useful purpose.

Of course, this argument was used by the advocates of the new road, who stated that it would be laid out in an "unused" portion of the park. One of the Park Commissioners happily exposed this fallacy in a letter addressed to the Legislature to urge the repeal of the act authorizing the speedway. He stated that there can be no "unused" portion of the park; that its green fields are fulfilling their highest use when no foot treads upon them; that the park really exists for its landscapes, and that its elements have their highest value as they combine to give it the charm of a rural scene. It is a place to look at primarily, and its untrodden greens and unentered groves are the very foundations of its beauty. This is a lesson which cannot be too often or too strongly insisted upon. All classes and every interest which have ever clamored to get possession of some portion of the park have urged in favor of their encroachment that "the park was made to use, and not to look at," when the fact is that its primary use is to be looked at; that it is beauty which gives it value, and a value which is not sentimental, but real, fundamental and practical.

Notes of a Summer Journey in Europe.—XII.

SELDOM have I spent time so pleasantly and profitably as I did two or three days at the Botanic Garden, or little arboretum, of the Government Forest Academy at Münden. Both the pleasure and profit which I derived were largely due to the fact that I was under the guidance of Dr. H. Zabel, whose modesty does not allow him to take any more pretentious title than "Königlicher Gartemeister," but whose acuteness and carefulness as a botanist and skill and knowledge in cultural details give him a well-deserved reputation, worth much more than any formal title.

The Forest Academy at Münden was established about twenty-two years ago. It is situated almost in the heart of the little town, which, by the railway, is about half an hour's ride from Cassel, and is in the midst of a region of large areas of forests. Three or four degrees below zero of Fahrenheit is considered very cold here and especially disastrous to vegetation when there is little or no snow on the ground, as occasionally happens, while eighty-five degrees in summer is considered very hot, and is rare. The temperature is greatly modified by the surrounding forests, but early frosts in September and late frosts in May are liable to occur. The grounds of the academy and its connected Botanic Garden only comprise about eighteen acres, which are almost entirely given up to classified collections of hardy plants. The academy buildings are well fitted to answer their purposes, and comprise library, laboratories, lecture-rooms and rooms devoted to specimens, and a collection of tools and appliances relating to arboriculture, forestry and dendrology. The students have the extensive surrounding woods in which to prosecute study and work in practical forestry. It is an excellent station for a school of this kind, because within easy access woods are to be found growing under different conditions of soil and exposure.

It is not my purpose, however, to notice this establishment as a forest-school, but rather to mention a few individuals in the remarkable collection of shrubs which exists here. The limited area of the grounds immediately about the academy does not permit of a great growth of trees nor of the introduction of all the numerous garden forms, but the collection contains typical examples of the various species which have attained a fair size considering the short time since the institution was established. But the same number of years have sufficed for a mature growth of most shrubs, which are largely arranged in botanical order and sequence and afford opportunities for some most interesting studies.

I was much surprised to find here some specimens of rare plants which are not to be seen in collections of much greater fame and endowment, for the whole annual cash appropriation for the maintenance of the Münden garden would hardly pay the salary of one good gardener in America.

Considering the winter temperature it was interesting to note

unexpected indications of hardiness in certain plants, while others, which are considered perfectly hardy in the somewhat colder climate of Boston, are said to be tender here. Undoubtedly, the discrepancies in records of hardiness are largely due to the difference in the heat of the summers and also to the degree of humidity.

The Japanese *Ampelopsis* (*A. tricuspidata*, or *A. Veitchii*, as it is commonly known in nurseries), for instance, is not considered hardy at Münden, while it is now one of the most common and best-known wall-climbers in Boston. It is a fact that seedlings or young plants are liable to have a part of their stems destroyed in winter, but when the plants become well established in well-drained soil there is no further trouble.

Mere hardiness, however, is not the only consideration necessary to the successful growth and naturalization of plants, and this is illustrated by the fact that the Douglas Spruce does not seem to thrive at Münden, although it grows so finely at Berlin and most other places where it has been introduced. Plants twenty years old are still shabby little things a few feet high. Whether this is owing to peculiar conditions of the soil or some such cause is a matter for investigation. But some other Pacific coast or Rocky Mountain conifers do well, for we find here the much more tender *Sequoia gigantea* with a stem over a foot in diameter, Lawson's Cypress twenty-five feet high, and even *Pinus contorta* quite healthy and fifteen feet in height. The Western Hemlock (*Tsuga Mertensiana*) has grown over twenty-five feet, while two Japanese conifers, *Picea Alcoquiana* and *Larix leptolepis*, have made the exceptional growths of over thirty and of forty-five feet respectively. Although the latter bears an abundant crop of cones, it produces no good seed.

Perhaps the very rarest plants in the collection are our *Cercocarpus*, the so-called Mahogany-trees of the western states, both of the United States species being represented. Probably these plants cannot be counted of much ornamental or horticultural value, and perhaps it is for this reason that greater efforts for their successful cultivation have not been made. Nevertheless, they represent a curious and interesting genus in the Rose-family, and on this account one would expect to find them in cultivation in botanic gardens or arboretums. They are, however, generally considered difficult to cultivate. The plants at Münden are the only specimens I ever saw, and it is doubtful if examples exist even in such great collections as there are at Kew. *Cercocarpus ledifolius* has attained a height of eight feet and has flowered, while *C. parvifolius* (*C. betulifolius*, Nuttall) is about seven feet high, and has flowered and fruited, and is considered quite hardy here. On the other hand, *Stuartia Virginica* is not thought hardy, although it lives. Some other American shrubs seem quite at home, and grow with a vigor rarely seen in such species in cultivation. Our little White Mountain Cutler's Willow (*Salix Cutleri*) is thriving well, the extremely rare *Neviusia Alabamensis* is represented by a very good vigorous plant, and the uncommon Colt's-foot (*Galax aphylla*) is better than is usually seen in gardens. The rare *Fendlera rupicola* is here bearing fruit, and a fine large clump of *Itea Virginica* was just (August 18th) going out of bloom.

All accounts describe the little Pale Laurel (*Kalmia glauca*) as being a slender and very straggling shrub. It certainly usually is so in its native swamps, and in cultivation it rarely assumes a very bushy character. That it may be grown in much better form is shown in this garden, where may be seen a splendid compact specimen three feet high and five feet across. This species is so different from the other two (*K. latifolia* and *K. angustifolia*), and it blossoms so much earlier, that it should be better known in all gardens where Heath-plants will grow. The tomentose-leaved *Clethra*, which has often been classed by botanists as merely a southern form of our *C. alnifolia*, was already in bloom. This specimen is ten feet high, and bears the very appropriate name of *C. tomentosa*, by which cultivators distinguish it from the northern smooth-leaved species. It has a peculiar value in its habit of blooming much later than the typical *C. alnifolia*. *Pyrus rivularis*, the Wild Crab of Oregon and that region of our continent, is here about twelve feet in height, and fruiting, while the Pawpaw (*Asimina triloba*) is a bush seven or eight feet in height.

The garden contains a considerable number of interesting Japanese species of woody plants. I was surprised to find *Abelia serrata* counted among the hardy shrubs. Wherever it can be found to endure the winters this should be a desirable plant, on account of its pretty light reddish, sweet-scented flowers and deep green foliage. *Helwingia rusciflora*, also commonly known as *H. Japonica*, is a native of Japan and China rarely seen in cultivation, probably because it has no

known ornamental qualities. But it is interesting as a curiosity, because the very small and inconspicuous flowers are produced on the midribs of the leaves about in the centre of the upper surfaces. The species is dicocious, the staminate and pistillate blossoms being produced on separate plants. The specimen at Münden is three or four feet high and is staminate, and has therefore produced no fruit. This curious shrub has not yet proved hardy at the Arnold Arboretum, but it has flowered, producing staminate blossoms. As there appear to be no records to the contrary, it would seem that the plant has not yet fruited in Europe or America. The fruit is a rather dry little drupe, but it is said that the natives of the mountains of Japan use the young leaves as a vegetable. *Hydrangea scandens* and *Schizophragma hydrangeoides* are two Asiatic plants about which there is often much confusion. The *Schizophragma* has not yet been found very hardy at Münden. In ordering either of these species from nurseries one is liable to get the other. But the *Hydrangea* may always be known by its very few sterile or ray flowers having four large rounded or retuse bracts together and in opposite pairs, while in the *Schizophragma* the leafy bracts are solitary, oval, narrow and somewhat pointed.

Another plant which may be mentioned, because extremely rare in cultivation, is *Eleutherococcus senticosus*, a hardy Araliaceous plant from northern Japan and China, which I found here seven feet high and in fruit; while *Acanthopanax ricinifolia*, a member of the same family, is fifteen feet in height and gives every promise of becoming the large tree with a tropical aspect, which it is said to be in Japan. This species has proved quite hardy at Boston, and it is probably capable of withstanding quite a number of degrees below zero of Fahrenheit.

The species mentioned give but a slight idea of the character of the collection of shrubs and trees under Dr. Zabel's care, and yet the rare herbaceous perennials have not been referred to. The collection contains a very interesting and complete series of species and varieties of *Spiræas*, one of the most distinct of the least known being *S. longigemmis* of Maximowicz. Numerous hybrids of these, and also of Bush Honeysuckles, have been procured and propagated, and from these some improved forms possibly may be introduced to add beauty to our gardens.

Arnold Arboretum.

J. G. Jack.

Plantains.

THE following extract is taken from the last report of the Botanical Garden at Demerara:

The generally accepted opinion of botanists is that the Banana and Plantain are but forms of one species. Yet, from an economic point of view, the two are widely separated, for, in regard to utility as a food-product, the banana cannot be compared with the plantain. Without explaining all the differences, it may be briefly stated that while the banana is a pleasant, agreeable and much-appreciated fruit, it has, judging by the preference of the people of torrid lands, little economic value as a food-product; the plantain, on the other hand, is regarded as intrinsically one of the best natural food-products in the world. Yet the opinion of the botanists is in a way supported by the non-scientific observer, for, except in rare instances, only after long and well-trained field experience can one plant be distinguished from the other when not in flower or fruit. When in fruit, however, the case is different. There is then a character, observable at sight, which only requires to be pointed out for the veriest novice in the subject to be able to tell which is which. In the Banana, after the fruit has set, the succeeding clusters of flowers, often a hundred or more in number, and their large embracing bracts, drop away, leaving a clear, absolutely naked, long extended and still elongating stem or axis, hanging tail-like two to three feet beyond the fruit, with the firmly compacted mass of unopened bracts and flowers, bud-like, at the end; while in the Plantain the stem ceases to extend more than twelve or eighteen inches beyond the fruit, the succeeding clusters of flowers and bracts all opening to the very end, and remaining persistent, withered and dry—the trash as it is called in colonial phraseology—permanently attached to the stem. In the Banana the axis continues to grow as long as the fruit hangs, cluster after cluster of flowers, with their bracts, opening and dropping away, a mass, like an enlarged *Nelumbium*-bud, still unopened, remaining at the far extended end when the bunch is cut; while in the Plantain the growth of the axis is arrested soon after the fruit sets, the abortive flowers opening, and remaining attached, from end to end of the stem. A single exception to the rule obtains in the

case of the Dwarf or Chinese Banana (*Musa Cavendishii*), in which, as in Plantains, the abortive flowers and their bracts are constantly persistent. The texture of the plantain is such that at whatever stage it is used, whether green or ripe, it must be cooked to make it palatable. It is this quality in the plantain which makes the great economic difference between the two fruits. Plantains are chiefly used by the populace while still green—i. e., cut at some period before they are full grown. They are cooked either by boiling or roasting, chiefly the former. To successfully peel a green plantain without soiling it, the operation must be performed with wet hands or with the fruit immersed in water. The plantain contains a measure of tannic acid, and consequently in boiling in a metal pot has a tendency to turn very dark. This may, however, be prevented by boiling a little fat with the fruit—say a bit of fat pork. Green plantains are also used for making soup. For this purpose they are boiled and then pounded in a mortar, when they form a homogeneous mass, like dough, which is put into soup and eaten with it. In the mature, but still green stage, plantains are roasted and eaten with butter, pepper and salt, and in some cases cheese. In this state they are delicious. The plantain parts with its heat very rapidly, and in cooling it loses, to the palate, much of its best taste. It is spoiled by re-warming. For this reason roast plantains are usually served wrapped in a table-napkin, for, to be enjoyed at all, they must be eaten before they cool. When ripe—that is, when the skin has turned yellow—a fruity character is assumed, and then they are used either baked whole in an oven, or cut in slices and fried. Baked ripe plantain has much the taste of baked apple, but with a distinctive flavor, and a much more tenacious nature. Lastly, gathered green, dried and ground or pounded, an excellent meal or flour is produced, which makes delicious custards, puddings, gruel, etc., and is highly palatable and nutritious.

Plantains being the staple food of the Creole population, Plantain cultivation is a firmly established industry. Three or four varieties are grown, one or two of which, however, only on a very small scale. Two color-varieties, presenting hardly any distinction in the character of the fruit, but with the stems and stalks of the leaves blackish in one and green in the other, are most generally grown, and form the bulk of the cultivation. They pass under the names of the Black and White, Common or Cow, and sometimes Maiden Plantain. The others are the Giant, or Horse, and the Barooma, both very large-fruited kinds, the latter of which is not much grown. Plantains give a heavier yield than Bananas from the same land. They delight in the stiff, newly empoldered clay lands of this colony, not objecting to the slightly saline element found where the sea or river has invaded the place periodically at spring-tides while it was lying fallow under the natural bush-growth. Such lands yield heavily, but the crop is liable to suffer, if the seasons for the first two years after planting prove very wet, from the Plantain-disease of the colony. On dry land it does not do much damage. Introduced to such land it soon disappears again. The disease which affects Coconut-trees, from which many are from time to time lost in ill-drained situations, appears to be identically the same. In both cases it takes the form of internal decay, the substance turning to a sodden, offensively scented, putrid mass. The plantains produced by diseased trees are black inside, but not soft like the interior of the stems and root-stocks of the plants. They are, of course, quite unfit for food. Its nature has not yet been determined, though it has been observed closely in the fields, and samples of the affected parts have been examined by distinguished mycologists to ascertain whether or not it be of fungoid origin. The aboriginal Indian inhabitants of the interior do not, as a rule, cultivate this fruit, though they grow here and there in their cassava fields pineapples and a few bananas.

The Forests of Lower California.

ALONG the boundary between Upper and Lower California no forests exist and the variety of trees is very limited. A few miles south of the boundary, on the broad table-lands of auriferous gravel, begins the beautiful Piñon forest, composed mainly of a Nut Pine (*Pinus Parryana*).

These trees only partially shade the ground, forming an open forest, perhaps thirty miles in width in places, and extending from near the boundary line southward along the backbone of the peninsula, with only an occasional break, to the south end of the Sierra San Pedro de Martin. This forest is continuous for nearly fifty miles, the plateau which it covers varying in altitude from 3,500 feet to near 7,000 feet.

The Piñon is a small but very graceful tree, usually under thirty feet in height, with sheaths of short leaves, which densely clothe the tree. In shape it is very symmetrical, especially such young trees as have not been exposed to adverse conditions.

Encircling the meadows at high elevations is found the Bull Pine, or Piños, which J. G. Lemmon calls *Pinus Jeffreyi*, var. *peninsularis* (*Third Report California State Board of Forestry*, 200). It seems to be most abundant on the mountains east of the San Rafael Valley, at an elevation of 4,000 to 6,000 feet, where it attains magnificent proportions. Lemmon describes this tree as varying from medium to large size, 150 to 200 feet tall. The mining camp of Alamo, locally best known as Hanson's ranch, now obtains its main lumber-supply from this region. On the east the descent to the plain of the Colorado desert is very abrupt, and along the precipices overlooking the desert another Piñon Pine (*Pinus monophylla*) maintains a precarious existence.

A greater diversity of forest-vegetation exists on the San Pedro de Martin mountain, the highest mountain in Baja California. Its elevation at the highest point is over 11,000 feet. On this mountain occur the Sugar Pine, Coulter Pine, the White Fir and other trees which here find their most southern station. The summit of the mountain is a world in itself, over fifty miles in length, and was selected as the site of one of the old missions, the ruins of which may yet be distinguished. It is very difficult of access, and as yet has never been visited by a botanist.

The two views published in this issue will be of especial interest as giving a glimpse into an unknown land, and are from photographs taken by Messrs. Roscoe Howard and Russell Gunnis, the first men to invade these sylvan glades with a camera. The Pine in the foreground is Jeffrey's Pine (see page 185). The magnificent proportions of this tree may be realized by a comparison with the man standing beneath it, while the trees around even surpassed it in altitude.

The broad grassy meadows intervening between these patches of woods are still pastured by deer, and game of other descriptions abound. The coyote and the mountain lion are not unknown. The noonday siesta of the rattlesnake is seldom disturbed, while the call of the quail alone breaks the silence of the woods.

To the southward of this mountain an unbroken desert extends for two hundred miles, while desert sands alone intervene between its eastern base and the Gulf of California. Thus San Pedro de Martin furnishes the most southern typical California forest, the forest farther south being composed mainly of cacti and desert vegetation.

C. R. Orcutt.

San Diego, Cal.

Plant Notes.

Some Recent Portraits.

To American readers the most interesting figure in the March issue of the *Botanical Magazine* is that of *Cereus giganteus* (t. 7222), the great Tree Cactus of Arizona and Sonora, but not a native of southern California, as is here stated, whose flowering in England last year Sir Joseph Hooker very properly considers one of the triumphs of horticulture. The plant which flowered at Kew is fourteen feet high and four and a half feet in girth, and was procured from Messrs. A. Blanc & Co., of Philadelphia, whose collection of succulent plants is probably unrivaled in the United States. *C. giganteus* is one of the vegetable marvels of the world, sending up a tall single shaft sometimes sixty feet in height, and sometimes separating near the top into two or more upright branches. It is the tallest, although not the stoutest, of all Cacti, and produces an edible fruit which the Indians of the south-west devour both raw and made into a conserve. Numerous attempts to cultivate this plant have been made since General Emory first gathered the seeds as long ago as 1847, during his military reconnaissance from the Missouri River to San Diego, in California; and although Dr. Engelmann succeeded in germinating the seeds and inducing the young plants to live, they have grown so slowly as to give little promise of ever reaching sufficient size to flower. A peculiarity of the plant not noticed in this description is the wonderful durability of the hard woody skeletons of the stems; these can be found lying about the desert and are used for the rafters of houses and apparently are indestructible by any influence of weather.

In the same issue are figures of *Dianthus callizonus* (t. 7223), a lovely Pink of the calcareous Alps of Transylvania, where it flourishes at an elevation of some seven thousand feet above the sea. It appears to be closely related to *D. alpinus*, and, like that species, has solitary flowers with crenate rose-colored petals with a deep red zone of color at their base speckled with white, although the flowers are larger and the leaves more glaucous than those of that species; *Gongora gratulabunda* (t. 7224), a not very showy or horticulturally interesting Orchid, probably a native of Granada, where it was discovered by Warscewicz, and was first flowered in 1857 by the late Consul Schiller, of Hamburg; *Chrysanthemum rotundifolium* (t. 7255), a handsome Hungarian species, differing from those in general cultivation by its strict rigid habit, acutely angled stem and branches, corymbose many-flowered inflorescence, and broad leaves. It belongs to the section *Pyrethrum* of the genus which includes most of the perennial white-flowered species, although it differs from them in the terete, not ribbed or angled achenes, and in the cupular pappus. It is a low-growing plant in cultivation, rarely exceeding the height of two feet, and in the rockery at Kew flowers freely throughout the summer; *Lysimachia paridiformis* (t. 7256), a native of China, where it was collected by Dr. Henry on the Yang-tse-kiang River in 1889. This is a handsome red-stemmed species with bold leaves, yellow corollas, marked like the calyx with glandular streaks, unequal filaments, monadelphous below, and few-seeded five-valved capsules. It is said to be more closely related to *L. quadrifolia* of the eastern United States than any other described species, although the flowers are much larger than those of the American plant.

New or Little-known Plants.

A New Strain of Roses.

IT now appears that the Rose may be added to the list of plants which may be treated as annuals. Seeds of a variety, under the name *Rosa polyantha remontant*, received from a French seedsman early in the year, were sown January 10th. They germinated rapidly in greenhouse warmth, and, after being pricked out, have been grown in a pan on a shelf in the cool house. They are now small plants, two to three inches high, and every shoot apparently is carrying a bud. The first flowers opened April 9th, just three months from sowing. The flowers are coming in considerable variety, white and pink mostly, single and semi-double, an inch or more in diameter. At present they are charming little plants, with small stems and small light green foliage. With their prolific flowering habit and rapid growth they can scarcely fail to prove useful and attractive garden-plants.

Their precocity is certainly novel and interesting. Some few years since Carnation-growers were much surprised by the introduction of a strain of these flowers which could be had in flower in four or five months from seed, surprise which has given way to satisfaction with the desirable *Marguerites*.

Perhaps, the Rose having developed a precocious habit, we may be favored with even finer forms than *R. polyantha remontant*. It would seem that flowers are being inoculated with some of the rapidity of the age.

Elizabeth, N. J.

J. N. Gerard.

Foreign Correspondence.

London Letter.

HIPPEASTRUMS AT CHELSEA.—The special attraction this month in the nurseries of Messrs. J. Veitch & Sons is the collection of *Hippeastrums*, more popularly known as *Amaryllises*. These plants have been a specialty, almost a monopoly, of the Veitchian firm for the last ten years. They have raised many new varieties, every year producing a crowd of new seedlings, a large proportion of which are so far an advance as to merit certificates from the Royal

Horticultural Society. Several houses and frames are devoted exclusively to these plants at Chelsea, one house, sixty feet long by eighteen feet wide, being entirely filled with the flowering bulbs. These flowers are now rapidly approaching perfection, hundreds of fat succulent scapes bearing clusters of enormous trumpets of the brightest as well as the most delicate hues, and forming a picture which gives a horticulturist peculiar pleasure—a picture

is, at any rate, general. We all get excited over big flowers, from *Rafflesia*, *Aristolochia* and *Victoria* to the big *Chrysanthemums* and *Begonias*. *Hippeastrums* are big by nature, so that the breeder had only to improve them in form and tone down their sometimes harsh colors to ensure success. This has been accomplished, chiefly by Messrs. J. Veitch & Sons and the De Graafs of Leyden, and *Amaryllis* is to-day, in England at any rate, one of the most admired of garden-plants.

CYTISUS SCOPARIUS, var. *ANDREANUS*.—I omitted this plant from those mentioned last week as good for forcing. At Kew there are now in flower some beautiful examples of it. They are standards, having been grafted upon the ordinary *Laburnum*, and each plant has a head a foot through, formed of many long branches, which are clothed for their whole length with beautiful yellow and rich madder-brown flowers. Among the many flowers at Kew at the present time these plants of André's Broom are, I believe, the most admired by visitors. They are grown in pot all the year, plunged in the soil outside during summer, then placed in a cold frame for the winter, and forced into flower in March by the application of a little heat. If your florists have not made the acquaintance of this Broom already, permit me to strongly recommend it as one likely to find universal admiration.

AMORPHOPHALLUS RIVIERI.—This is a small edition of *A. Titanum*, the huge Sumatran Arum flowered at Kew several years ago. The former is represented by two flowering specimens in an intermediate house at Kew, where it grows well, although it is hardy in a sheltered border. It does not often bloom in gardens, being grown rather for its handsome foliage. The inflorescence is a yard high and has a stalk a foot or so long, a trumpet-shaped spathe nine inches across, and a very long erect club-like spadix. Its color is reddish chocolate. Like all Arums, it emits a very penetrating and unpleasant odor for the first day or so after flowering. It is supposed to be a native of China, though nothing definite is known on this point, it having first appeared in the garden of Monsieur Rivier, in Algeria, about twenty years ago.

BEAUMONTIA GRANDIFLORA.—This plant is now in flower in one of the stoves at Kew. It is a splendid stove-climber, and I gave an account of it in *GARDEN AND FOREST* two years ago, when it flowered magnificently in several gardens near London. It has no equal among large white-flowered stove-climbers; its long trumpets of ivory-white flowers, as large as those of *Lilium longiflorum*, being borne in great clusters on the end of almost every one of its numerous short lateral branches. It grows to a large size, and therefore requires plenty of room, both for the roots and stems. In a sunny tropical house, where it can be treated liberally in summer and kept dry at the root in winter, it makes a magnificent display in March or April. It is Indian and Apocynaceous.

CHINESE RHODODENDRONS.—Chinese plants are conspicuous in the conservatory at this time of year. The Moutan *Pæonies* (forced), the Camelias, and various *Rhododendrons*, commonly known as Azaleas, are the glory of the greenhouse in spring. Of course, the two best known of the Chinese *Rhododendrons* are the hardy deciduous *R. Sinensis* (*Azalea mollis*) and the "Indian Azaleas," which are not Indian. Beside these, however, we now know of over sixty species, all natives of China, mostly in the province of Yun-nan. Some of these are in cultivation,



Fig. 28.—*Pinus Jeffreyi*, var. *peninsularis*.—See page 183.

of health, vigor and wealth of bloom; or, in other words, first-rate cultivation. *Hippeastrums* are among the most recent of the triumphs of horticultural skill. From several species with large flowers, but coarse and "unfinished" from the florist's standpoint, a race of plants has been evolved which have all the charm that size, rich and delicate colors and excellence of form give to flowers. The worship of the big for its own sake may be vulgar, but it

is, at any rate, general. We all get excited over big flowers, from *Rafflesia*, *Aristolochia* and *Victoria* to the big *Chrysanthemums* and *Begonias*. *Hippeastrums* are big by nature, so that the breeder had only to improve them in form and tone down their sometimes harsh colors to ensure success. This has been accomplished, chiefly by Messrs. J. Veitch & Sons and the De Graafs of Leyden, and *Amaryllis* is to-day, in England at any rate, one of the most admired of garden-plants.

mostly through the missionary collector Delavay, who sent seeds of them to the Jardin des Plantes in Paris. I have seen the dried specimens of these Yun-nan Rhododendrons, and they look full of promise for the garden. Mr. Hemsley says that, taken as a whole, they are by no means so gorgeously beautiful as the Himalayan species, though many of them are highly ornamental.

A strikingly beautiful Rhododendron from China is *R. Fortunei*, which was introduced by Robert Fortune in 1859. It is perfectly hardy in England, forms a large handsome evergreen shrub, and produces in early summer large trusses of rosy white flowers nearly as large as those of the great *R. Aucklandii*, which it most nearly resembles. It is remarkable, too, in having seven corolla-segments instead of the usual five of the flowers of this genus. *R. rhombicum* is Japanese. It is an interesting plant, deciduous, with rosy purple flowers, and easy to force. It was introduced to St. Petersburg in 1872. We grow it for the greenhouse at Kew. *R. linearefolium*, also Japanese, is an older garden-plant, but as yet very little grown in England, notwithstanding its hardiness here. It makes a fine bush, and is characterized by linear hairy leaves and flowers with long rose-purple segments divided to the base of the corolla.

AZALEA INDICA is now in every greenhouse, and is represented by very numerous magnificent varieties, mostly raised by the Belgian and French horticulturists. It is curious to read in the *Botanical Magazine*, under a figure of this species published eighty years ago, that it was then a "very rare plant, which has been long anxiously sought for by cultivators of curious and scarce exotics. We believe there are not above three or four individuals of it in the country, and of these only that from which our drawing was made has as yet produced any flowers." It is also stated that Kämpfer enumerated twenty-one varieties cultivated in Japan, including white, red, yellow, purple and scarlet, with spots of the most contrary hues. Fortune found every mountain and hill in the central and southern provinces of China covered with Azaleas as abundantly as Heaths occur here. The finest varieties were cultivated in the gardens there; in fact, only the cultivated kinds were worthy of introduction. The Dutch cultivated the Indian Azalea in 1680, but lost it soon after its introduction. The first varieties obtained from China were brought by a sailor and sold to Knight, of King's Road, Chelsea, in 1833. There were five of them, one a double-flowered variety. *Azalea mollis* has been improved by the Belgians, chiefly by Monsieur Louis Van Houtte, who raised numerous varieties with flowers of better substance and more varied colors than any imported. It was in cultivation here in 1824, and then called *R. Sinensis*. Fortune reintroduced it in 1845, when it was rechristened *Azalea mollis*.

London.

W. Watson.

Cultural Department.

The Best Garden Strawberries.

SHOWINESS rather than flavor has long been the end to which the originators of new varieties of strawberries have generally aimed. As is natural, they have had in view the needs of the market gardener, who is a large purchaser of plants, rather than the requirements of those who plant for home use. Therefore, an early, large, firm, showy, prolific berry has been the ideal one, with little regard to its table qualities. The chance that the best-flavored berry will possess one of these qualities in a marked degree is small. That it should possess enough of them to attract the large grower is improbable. So it is pretty much a matter of luck that we have really a first-rate berry at all.

The best berry that I have tested is the old Crystal City. In exquisiteness of flavor it is unrivaled and matches the best type of wild berry. Then its brilliant, glossy, crimson color makes it an ornament to any table. It is also an extremely early fruit, and for the first few days a very large one. But, while the excellence of color and flavor is retained, the berries soon run small and ill-shaped. Nor is it on the whole pro-

lific; still with those who value quality first, it is well worth raising.

The mammoth size of the Sharpless has won for it a higher place than it deserves, for it is the most deficient in the highest qualities of the strawberry. The color is almost always dull and unattractive, while the flavor is insipid. Nor is it so productive on most soils as other kinds that surpass it in everything except size. The Cloud has nearly all the qualities of a good table berry, except beauty. It is too dull and coarse-looking. The ideal strawberry must adorn a table as a bouquet adorns it. If the strawberry were deprived of its beauty it would hardly rank as it does as the first of fruits. The Cloud is medium early, ripening about with Crescent. The Henderson, which ripens somewhat earlier, is an equally good fruit and more attractive in appearance. All of the very early berries that I have tried, except Crystal City, are deficient in real merit. The Crescent, if allowed to get thoroughly ripe, is surpassed by few among the medium early varieties. Then, too, its wonderful productiveness will help to atone for its shortcomings in the way of flavor. No other variety approaches it in yield. Thrushes and cat-birds, connoisseurs in fruit, prefer the Haverland.

It is only when we come to the later varieties that we find in the Bubach an approach to the ideal berry. Neither in color, size, quality nor productiveness does it leave anything to be desired. On rich soil it will ripen within a week of any other good variety, and in view of its great merit no one will begrudge it these few days of grace. In beauty, both of foliage and of berry, it is unapproachable. A bed of this variety, with leaves of richest green, among which the berries fairly glow, is as beautiful as any bed of flowers. Though somewhat late, the bearing period of the Bubach is correspondingly prolonged, so that berries can be gathered for fully as long a period as from any other variety. Another quality of the Bubach, which should recommend it to the amateur, is that it puts out but few runners even on rich soil. Runners, when neglected and allowed to cover a bed, have been the undoing of many a sanguine gardener. Judging by the appearance of the bed while leafless in the early spring, he hesitates to attack it with trowel or hoe, and he discovers when too late that it has become a jungle of foliage with a scanty show of fruit. As early as possible in spring—the autumn before would be better still—the bed should be thinned out remorselessly till no two plants stand less than six inches apart. The Bubach on good soil makes runners enough, but will give less trouble in this respect than almost any other kind. As it is a pistillate variety it should be planted with some staminate kind like Sharpless or any other blooming about the same time. The Cloud and Crescent are also pistillate, as indeed are most of the best Strawberries. Crystal City being staminate will grow alone. Staminate plants, however, are by no means indispensable, especially on rich soil; but as they increase the yield and quality of the crop, they should be planted with the pistillate varieties when possible.

What was said about the Crescent may be repeated about strawberries in general—let them get ripe. Rarely, indeed, are they allowed to attain this perfect state. We are so eager after the long winter-waiting, and they look so inviting, that at the first gleam of color off the berry comes. But the strawberry is not really at its best till some days after turning perfectly red; nor is it really wholesome till then. Leave a corner of the bed until the fruit thoroughly ripens, and you will thoroughly enjoy strawberries for the first time.

Kittrell, N. C.

O. W. Blacknall.

Phajus grandifolius in a Window-garden.

WHEN, on the 20th of last February, Mr. John Saul, of Washington, sent me a piece of *Phajus grandifolius* from his Orchid-house, I called to mind the princely gift of an elephant which so embarrassed its poor recipient. To introduce this royal plant into my modest window-garden after it had been accustomed to careful nursing in the atmosphere of a hot-house, seemed very much like turning the elephant out to graze with a flock of sheep on a Scottish down. Nevertheless I determined to give it a chance. Fortunately, it was already well advanced, having four large healthy leaves and a short flower-stalk crowned with a bud, mysterious enough to us who have had little close acquaintance with Orchids, excepting a few hardy, small-flowered kinds. We could not guess what manner of surprise that close-shut bud might contain, but had little hope that it would ever condescend to reveal its secret in our sitting-room.

We did the best we could for our guest, potting it at once in fibrous loam, rich compost and the sphagnum which was

wrapped carefully around it when it came. The thermometer registered five degrees, Fahrenheit, that morning, but the box of tender plants arrived in perfect condition, many of them blooming, with earth around their roots and a coat of sphagnum and another of paper over that to keep them warm and snug, a fact which shows the ease with which tender plants can be sent long distances in cold weather if they are properly packed.

When we had potted the Phajus we searched the indexes of GARDEN AND FOREST and learned, among other things, that a refractory Phajus of another species had been induced to bloom by putting it in the very warmest spot in the hot-house and watering it freely. We took the hint, and watered our treasure twice a day with warm water, placing it as near to the base-burner, which heats our sitting-room, as possible. On cold nights we put the pot on the mantel-shelf, and we sprinkled it overhead with tepid water every day.

Under this treatment we soon found that the stem was stretching out. Up and up it climbed until it caught up to, and then towered above a fine Amaryllis in the same window which has a southern exposure. When it was three feet in height it stopped ascending, and the bud began to swell, but

Flower Notes.

STANDARD ROSES.—These are rarely, if ever, grown outdoors in this country, owing to the fact that the strong summer sun burns the bark of the *R. canina* stock, the only one used for standards. These are, nevertheless, very useful when grown in pots for piazza decoration in early summer. As we need to have ours in bloom by the middle of May, they are taken indoors toward the end of March, pruned and top-dressed with rotted cow-manure. If they have good healthy heads more shoots will be made than will carry good flowers, and so a little disbudding is advantageous. After blooming they are pruned back a little, some soil is taken out of the pots, and replaced by good fresh loam, cotton cloth is wound round the stems to protect the bark from the hot sun, and the pots are plunged out-of-doors for the plants to make their season's growth, when, after ripening with frost, they are placed in the cellar for the winter. Whether *Rosa multiflora*, the new stock (from Japan) which Mr. Jackson Dawson is experimenting with, will ever develop stems suitable for standards, is a question of time. For dwarfs I think it is destined to supersede the Manetti and Dog Rose stocks, owing to its hardiness and superior vigor.

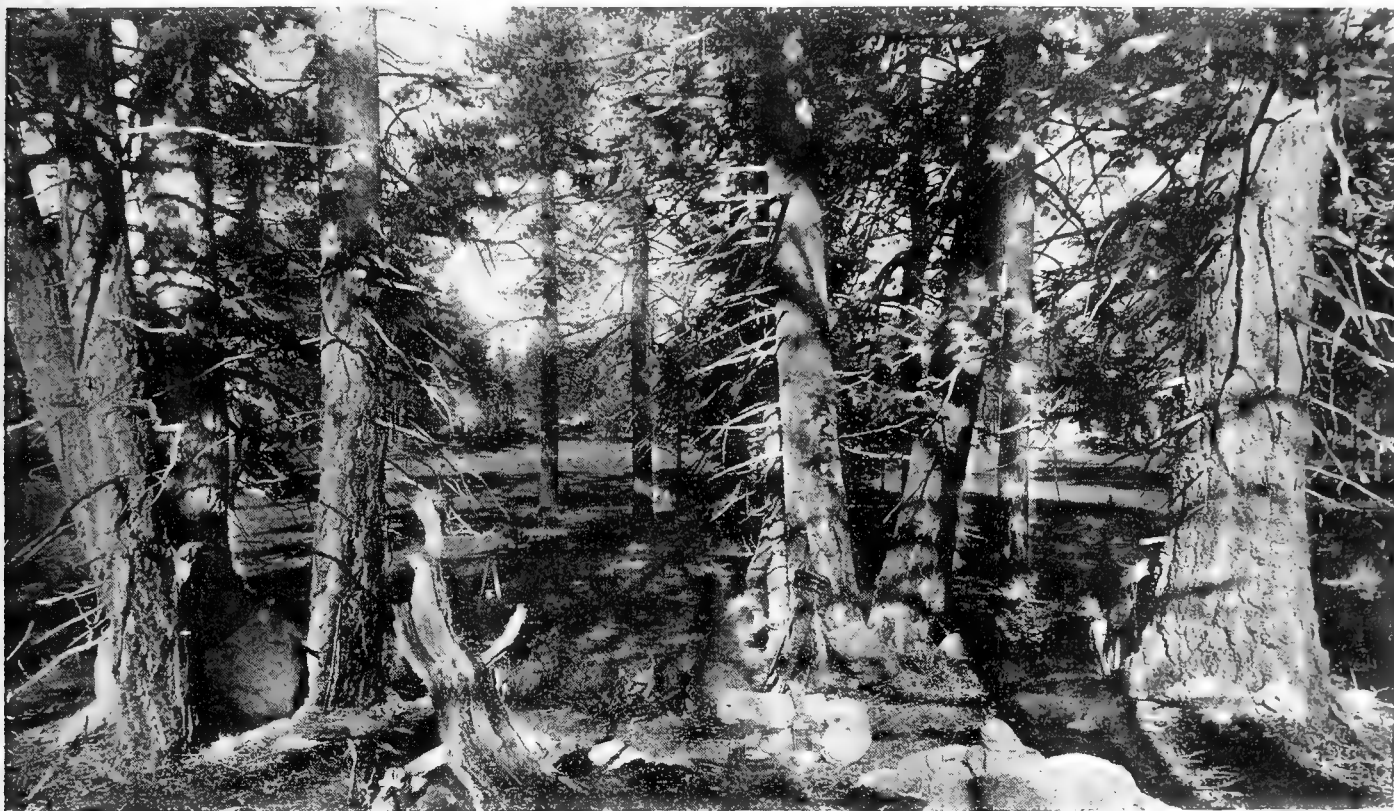


Fig. 29.—A Pine Forest in Lower California.—See page 183.

so slowly that we could not be quite sure that it was really not standing still. In another week the bud separated into seven, and we watched it with increasing interest. At last the lowest bud changed its position from perpendicular to horizontal, and on the 4th of April it had become an exquisite flower, and greeted us with that wide-eyed look which makes one feel as if flowers could see.

Now, on the 12th of April, there are five of its curious blossoms to look at and to wonder over, with two others soon to expand. The plant is remarkably graceful, with its wing-like fresh green leaves, and the quaintly beautiful blossoms mingling sad shades of light chocolate, reddish purple and cream, so blended as to form an exquisite combination. The striped lip is a striking feature, and the silvery lining of the sepals and petals has a rich tender bloom.

Having succeeded so well with Phajus grandifolius, we are impatient for fresh worlds to conquer, and would be glad to know whether other amateurs have attempted to raise Orchids in window-gardens, and what varieties are best adapted for this purpose.

Rose Brake, West Va.

Danske Dandridge.

Imported Roses are very unsatisfactory, because, for perfect satisfaction, there must be thorough acclimatization of both stock and cion. Mr. Dawson's stocks were American-raised seedlings of one year old, and, although they had only been grafted six weeks at the time of my visit, they had made remarkably rapid and substantial growth, and many were already in bloom.

MICHAUXIA CAMPANULOIDES.—I was pleased to see plants of this rare campanulaceous species looking fresh and sound after the winter. By some oversight this had not been protected by the usual covering of Pine-needles. The discovery of its hardiness was particularly interesting to me, as it is one of the things which are considered tender and very difficult to winter in England. A dry, warm, sunny position is generally recommended for it, but where it grew was neither dry nor warm, but the reverse. It is a biennial, and makes a large rosette of Dandelion-like leaves the first season from seed, and forms a Turnip-like root. The following season very rapid growth is made, and if vigorous it will produce an immense spike of white flowers, slightly tinged with pink, which rivals in stateliness the well-known *Yucca angustifolia*. Seeds should

be sown in early spring in the greenhouse. The seeds are so small, and the seedlings so delicate for a long time after germination, that it is almost useless to sow them in the open border. Years ago I grew some fine specimens of this plant in pots, but, although I was thus able to keep the roots dry and cool, I yet failed to save over thirty per cent. of them through the winter. If I have the good fortune to try them again in pots, I shall let them freeze.

LENTEN ROSES.—These plants, mostly hybrids of *Helleborus Colchicus*, *H. guttatus*, *H. Olympicus*, *H. purpureus*, *H. orientalis* and others, of which the varieties *Irene Heine*, *Hofgarten*, *Inspector Hartweg* and *Willy Schmidt* are representatives, are now in bloom. They are very hardy and desirable plants, and some are really beautiful, many of the hybrids being far superior to the types in distinct and bright coloring. In this country they take the place of the Christmas Rose, which, however beautiful, is unsatisfactory, since its natural blooming season is at a time when our winters are too severe to allow of anything in the shape of active vegetation to flourish; and, on the other hand, the summers are too hot. The raising of hybrid Lenten Roses is slow, but very interesting work. The seeds are very slow to germinate. A year ago last August I sowed a lot in a box, and expected to see them come up last spring. Out of five hundred seeds sown only twelve germinated; but this year, I think, nearly all the others must have started, as the box is quite full.

The best plants I have seen were grown under Quince-bushes, which seemed to give them just shade enough.

Wellesley, Mass.

T. D. H.

Narcissus Bulbocodium.

IT is a matter of surprise that this *Narcissus*, the Hooped Petticoat Daffodil, is not more generally known and cultivated by those who grow bulbous winter-flowering plants; while many others are grown in immense quantity, these little gems are seldom seen. When trying to obtain some bulbs last fall I was told they could not be found to the number required in any of three large cities, and they had to be imported before an order for 500 could be filled. No bulb gives more flowers in proportion to its size, as it is quite common to see five flowers to a bulb, so that when planted thickly in shallow pans the effect is very pleasing. It is possible that many have failed with this *Narcissus* because of attempts to force it. Under this treatment nothing but leaves will be produced, as is the case with the *Snowdrop* or *Crocus*. After being potted they should be wintered in a cold frame until the end of February, when the flowers will be produced with very little heat in a greenhouse or in a sitting-room window. *N. Bulbocodium* is of a bright yellow in the typical plant, but there is a variety known as *Citrinus* that has flowers of a lovely lemon-yellow, but this form cannot yet be obtained in quantity at reasonable prices. This last remark applies also to *N. cyclamineus*, the *Cyclamen*-flowered *Narcissus*, which to me is the prettiest of the whole genus. Its dainty and quaint appearance, so different from all others, makes one wish it would live longer in cultivation, but complaints are common that after once flowering it dwindles away, and such has been my experience. Mr. Barr, the *Narcissus* specialist, tells us it needs a moist situation when planted out; but, then, a New England winter is vastly different from that of Portugal, and planting outdoors here is not to be thought of. This kind was lost to cultivation for over one hundred years, owing possibly to the difficulty in growing it, and now that it is rediscovered there is a danger of its being exterminated by collectors unless better success is obtained with it under cultivation.

South Lancaster, Mass.

O. O.

Permanent Narcissus Beds.

AFTER *Narcissi*, and the same may be said of other bulbous plants of this class, have done flowering they should not be disturbed until the leaves ripen. A good way to treat beds in which *Narcissi* have been planted, say from a foot to eighteen inches apart, is to sow the seed of *Mignonette* between the rows, which will about cover the ground by the time the foliage of the *Narcissi* has died, or, at least, has so far ripened that it will sustain no injury from the *Mignonette*. After the first frosts in fall the *Mignonette* may be removed from the bed and a good top-dressing of well-decomposed manure given. The fall rains will wash the plant-food down to the roots of the bulbs, which are in need of just such encouragement to enable them to start again and flower the next year better than before. Many other tender annuals might with advantage be used in this same manner, and a permanent

bed of *Narcissi* can be had which will yield from year to year an abundance of flowers bright and fresh without any forcing-house feebleness. Then, too, the bulbs need not be thrown away after flowering, but they can be left in the ground to increase and produce double the quantity of bloom the next season. After the third year they should be lifted, separated and replanted. When the soil is a heavy tenacious clay the bulbs will be better if lifted every second year. The reason for this is that as the bulbs expand their growth is more or less hindered by the resistance made by the soil against which they press. If we lift a clump of any strong-growing *Narcissus* the third year from planting in a heavy soil, it will be found a compact mass of bulbs, small and imperfectly developed for want of space. These would hardly be able to flower another season; perhaps they would not flower well the third year even. Where the soil is light the bulbs meet less resistance, and they will be larger and stronger.

One who buys imported bulbs of *Narcissi*, such as *Sir Watkin* or *Bicolor Horsfieldi*, is at once struck with the difference between these and home-grown bulbs of the same varieties. The foreign bulbs have much shorter necks because of shallow planting, while home-grown bulbs have long necks, and present a very different appearance. Home-grown bulbs planted in August will prove far superior to imported ones in quality and abundance of bloom. There is a wide difference of opinion in Europe as to the best depth and time to plant. Our climate certainly calls for deep planting to guard against the action of frost, which may force the bulbs out of the soil and otherwise injure them. The lifting may safely be done as soon as the foliage begins to turn yellow. Roots will be found adhering to the bulb, but their work is done, and they are useless. It is good practice to reset the bulbs as soon as possible.

South Lancaster, Mass.

O.

Growing Plants in Moss.—Sphagnum has some advantages over soil, as a medium for the roots of plants, especially where it is desirable to have them in boxes or stands, and more particularly under the shade of trees, which, like the *Silver Maple*, are always ready to throw out their feeders and appropriate all the plant-food within reach. There are many plants which will thrive and make a good display all summer in such situations if they can be protected from the encroachments of the tree-roots, and this can readily be accomplished by growing them in boxes, which may be either placed on the ground or elevated by means of rustic supports, as taste may dictate. One of the most satisfactory flowering plants for such a position is the *Fuchsia*, and many plants with ornamental foliage do well. These boxes need not be over three or four inches deep, and in filling them I generally put in about an inch of soil first, although this is not absolutely necessary. I then fill in the moss in layers, with a good sprinkling of hen-manure or other good fertilizer between the layers, and, if the box is shallow, carry the moss somewhat higher than the sides and round it up in the centre. The plants are then dumped out of pots and the balls of earth well covered in the moss. Some of the advantages in using sphagnum are its readiness to take up and retain water, it does not crust over, and its porous nature admits air so freely that there is very little danger of injury by overwatering. Sphagnum is now offered by several firms in various parts of the country at low prices by the barrel, and those who cannot have ready access to swamps that produce it can easily procure it.

Hampton, N. Y.

Wm. F. Bassett.

Papyrus Antiquorum, the Egyptian Paper-plant, as it is often called, has long been prized as an aquatic plant, and when associated in the water-garden with the so-called *Lotus* (*Nelumbium speciosum*) it can hardly be excelled in gracefulness. As a general decorative plant for the conservatory and dwelling-house it is rarely met with, but it is equally adapted to this purpose, and good plants can be produced in eight or ten inch pots. Large specimen plants require to be grown in watertight tubs, and when used as the centre or as a background for groups and masses of plants it becomes a conspicuous object, towering ten to twelve feet high, with plumes two feet in diameter. As a pot-plant it is as readily grown as *Cyperus alternifolius*, and requires the same treatment, but being much stronger, it is not adapted to such small pots as the *Cyperus*. The soil should be good turfy loam, enriched with thoroughly rotted stable-manure. With the same soil in tubs without drainage it can be readily grown into large specimen clumps by using several pieces in one tub. When growing freely the tub should be occasionally filled up with liquid manure. General greenhouse temperature and treatment suits it admirably. As a summer decorative plant for the mixed border, or

in groups of sub-tropical plants, it succeeds well under the same treatment as Cannas, but for a specimen clump several pieces, according to size, should be set in half a kerosene-barrel, as recommended for conservatory specimens. The half barrel should be sunk until the rim is at the level of the ground and practically out of sight. With applications of liquid manure in hot and dry weather the clump will make an astonishing growth. The plants should not be allowed to suffer from high winds and storms, and a few neat stakes can be used, or other means of protection and support should be supplied. In the open ground this Papyrus is not inclined to grow so tall or make such rapid growth, but the stems will be stronger and will not need so much protection as the larger plants. Papyrus Antiquorum is propagated by divisions of the roots and by seed, but strong plants only produce seed to any extent. Seedlings raised early in the season make nice plants the first summer; strong clumps the second season.

Begonia Triomphe de Lemoine.—Plants of this variety were grown in the open border last summer with great benefit to the foliage and much better results in the way of flowers. For profuse and lasting flowers this variety probably heads the list of Begonias. The plants are fairly covered, as they have been for months, with masses of bright flowers, which scarcely even yet show signs of fading. The color is a bright light red, almost pink. A good stock of this plant in small sizes is very useful and attractive in the greenhouse in winter for decoration of the benches.

Corydalis bulbosa (or *C. solida*), the purple Fumitory, is a neat little bulbous plant now in flower. The leaves are attractive, and the effect is somewhat like that of a small Dientra, the plant being only a few inches high, with numerous purplish red flowers, not especially attractive except as a patch of color in a dull season, when all color is welcome. The bulbs are hardy, and rapidly increase from offsets. There is also a white variety of this species, but this has not been grown by me.

Elizabeth, N. J.

J. N. G.

Correspondence.

The Northern Limit of Sabal Palmetto.

To the Editor of GARDEN AND FOREST:

Sir,—Jutting out into the ocean at the mouth of the Cape Fear River, thirty miles below Wilmington, North Carolina, is the delta-like formation known as Smith's Island. Formerly the river had two mouths, one opening eastward at the north end of this island, and the other running out to the south. For the improvement of the entrance the mouth at the north end of Smith's Island has been closed by a stone dam nearly a mile long, connecting the island with the beach at Fort Fisher, of historic fame. This work has caused the current to scour out the southern channel until the river is now navigable by large ocean steamers, and its depth is still increasing. Having often heard of the sub-tropical character of the forest upon Smith's Island, I was glad to embrace the opportunity to visit it in company with Professor Holmes, State Geologist, and Mr. T. K. Bruner, Secretary of the State Board of Agriculture. Professor Holmes wished to study the geological character of the island, and Mr. Bruner and I had in view the lifting and preparation for removal to Chicago next spring of some specimens of the native plants, particularly the Palmetto.

Our course to the island was by Wilmington, and thence by steamer to Southport, the pretty pilot-town near the mouth of the river, from whence we reached the island in open boat. Southport occupies an elevated plateau on the right bank of the river, and its twelve hundred inhabitants are now stirred up with the idea of getting railroad communication to the Virginia coal-fields and making their beautiful village a great coaling-station. At present it is unspoiled. The streets are broad and clean, and all about, even in the middle of the streets, magnificent widespreading Live Oaks have been left, which add a peculiar charm to the place. In the cottage-yards native plants are not neglected, and I found beautiful specimens of the *Ilex vomitoria*, the North Carolina Tea, densely packed with its brilliant red berries, looking like glass beads from their translucent character. In one yard stood an Orange-tree, with leaves only slightly yellowed, testifying to the mildness of the locality. Phlox Drummondii, Verbenas, Sweet Alyssum, Violets and many other plants were blooming, as many of them had been all winter. Though an easterly gale was blowing, our boatman decided that we could cross to the island, four miles away, which we swiftly did, and landed in a quiet creek near the Bald Head Lighthouse. The island is

about six miles long and four wide. Its only inhabitants are the lighthouse-keepers at one end and the life-saving crew at the other. The larger part, and, in fact, all the upland part, is covered by the densest forest-growth imaginable, so dense, indeed, that it can only be penetrated by cutting paths with an axe. It is literally a forest of evergreens. Hardly any deciduous trees are found, and few deciduous shrubs. The principal forest-growth is *Ilex vomitoria*, which forms impenetrable thickets, Holly, Live Oak, Water Oak, Red Cedar, *Osmanthus Americana*, Pinus Taeda, called here Rosemary Pine, and lastly, but not least, Sabal Palmetto. Sabal Adansonii is plentiful on the mainland far north and east of Wilmington, but we found none of this dwarf plant here.

The magnificent growth of Sabal Palmetto here in what seems to be nothing but pure sand and shell fragments surprised me. We found plenty of trees with tall columnar stems thirty feet tall to the crown of leaves, and an immense multitude of young ones. I cut and brought home with me single leaves which measure five feet from base to apex, seven feet broad, with petioles six feet long. This shows that, although the tree does not range farther north, for none are found in the forest on the mainland north of the Cape Fear River, it nevertheless reaches its full development on the island. The forest is inhabited by countless numbers of raccoons, a great many wild hogs and feathered game, both land and water fowl, while the waters abound in fish, oysters and clams. We selected some grand Palmetto-stems for our forestry exhibit at Chicago, and made arrangements to have a large number of moderate size carefully lifted and planted in large boxes, which will be plunged at once where they grow, in hopes of getting a fair number established so that they can be transported to Chicago next spring to plant around the North Carolina building. Specimens of the *Ilex vomitoria* and *Osmanthus* will be treated in the same way. In the high mountains of the west we are also lifting the Balsam Fir and other plants of that locality, so that we can illustrate the wide range of climate in the state with plants of the climate of Canada and of the Mexican Gulf side by side.

The size of the Live Oaks on this island is surprising when the character of the soil is considered. We bored seven feet in the soil near Live Oaks four feet in diameter, and found only sand and shell fragments. Over the tops of the tallest trees the Smilax, probably *S. laurifolia*, made a cover as dense as Ivy, and in all the hollows back of the sand-dunes *Mitchella repens* made a thick soft carpet. On the beach Sea Kale (*Cakile*) was in bloom, and furnished an acceptable dish to the lonely dwellers at the lighthouse.

Raleigh, N. C.

W. F. Massey.

A Plea for Warm Tints in House-painting.

To the Editor of GARDEN AND FOREST:

Sir,—I have read with much interest the article on "Color in Rural Buildings," in your issue of March 30th, and while deferring to your contributor's well-known judgment in matters of taste, I would like to say a word on the side of those deeper and warmer colors in houses which she finds less well adapted to our atmospheric conditions than the whites, pale yellows and grays, to which she gives the preference, and at the same time to ask for some suggestion about the proper colors for villages.

Mr. Downing's rule for painting was to turn over a clod and paint the buildings the color of the soil disclosed, which he esteemed a method likely to bring the house into harmony with the surrounding earth. The color of the soil when wet would yield one tint, when dry another.

This rule, of course, if applied to a village, would produce monotony; but it was intended more especially to refer to the treatment of isolated country houses, which might be expected to rise from foundations widely different in hue, according to the geological formation of the region in which they were built. This method accounts for the unobtrusive and rather dingy shades which were employed in his time, which had, at least, the merit of not particularly forcing mistakes of construction upon the attention, and kept the building subordinate to the landscape. But, to my mind, the chief difficulty in painting a northern country house is that it must be adapted to two seasons, and, consequently, must hold its proper place in two widely differing color schemes.

In New England, for instance, for nearly eight months out of the twelve, every country house stands in a landscape from which all green but that of conifers has disappeared. It matters little of what hue a building is, when it has the vivid contrast of foliage to help it out, the soft dappling of leaf shadows upon its surface cast by surrounding trees, the relief of turf

and climbing vines about its foundations, and the sunny beauty of a summer sky behind. It is thus that the occupant of cities pictures a country house, it is thus that he sees it, and to this surrounding all mere summer cottages and houses may wisely be adapted.

But your true dweller in the country is faced by a different problem, having, unless his home stands in a bower of evergreens, to see it most of the time bare against a dull and lowering sky, with tall gray trunks of trees and a network of dark branches in relief against its surface, and frequently a snowy foundation and roof, to try its complexion still further. When the short and chilly days come, white and cold-colored houses have a shivery air, like lasses clad in summer gowns in a snow-storm. The green blinds make black spots against the prevailing whiteness, and the whole effect is apt to be disconsolate. Under these conditions a little red farm-house or school-house gives one a sense of satisfaction, of warmth and comfort, which shows that, after all, a dash of vigorous color does not come amiss in a New England prospect, which is sombre, if not dreary, for nearly three-quarters of the year.

Probably it was not aesthetics that our forefathers considered in their choice of colors, but economy, yellow ochre being the most enduring of colors, and white being the only pigment that permits refreshment of a building in the stained and disfigured portions, without making painting the whole a necessity. But it is one thing to have a white house in the south, surrounded by Oleanders and Camellias, with Palms and Eucalyptus to fleck it with shadows even on winter days, and another to see a house of this color staring bleak and cold under the shadeless gloom of a New England January.

The south of France and Italy show masses of foliage all winter long. The Live Oaks cast their dense shade, the glossy Camellias form clumps of verdure, Cyresses and Stone Pines are everywhere, the Eucalyptus is green in December; there are leafy hedges in the gardens always. In February the ground is dappled with Anemones and Violets. Winter there is but a nap of the blooming earth, not the syncope of the north, which sometimes almost makes one doubt whether the spring will ever come again, to loosen the cold slumberer from the iron bands in which the winter has bound her. Therefore, though our sun shines, and our skies are of pale blue, the conditions are widely different, and those gayly painted and frescoed exteriors, so amusing and pleasing amid the smiling winter surroundings of the Riviera, would seem as strangely amiss against our solemn Firs, and funereal Junipers, as a Puritan in motley.

For the same reason it seems to me that while light tints are agreeable in isolated summer houses, a country town must needs have more variety and warmth of color for those houses which are to be occupied at all seasons, and that there are many places where something warm and solid composes with the surroundings better than a light tint. The superiority of stained shingles over painted clapboards comes from the fact that the color surface is broken as it is in nature, and there are no broad stretches of one unvarying tint, which is of necessity inartistic. Stone and brick, plaster and unpainted wood take on a variety of shades that break up monotony, and unconsciously give satisfaction to the eye, which wearies of sameness; but neither stone nor brick nor plaster makes desirable country houses for all-the-year-round occupation in New England, for they gather dampness, and require artificial heat to keep them dry, except in the very middle of our short summer. Hence we are forced to the consideration of some artistic variety in the treatment, not only of wooden dwellings surrounded by grounds, but also of villages of frame-houses, which are even harder to manage, since one's neighbor's idea of color may be in direct conflict with one's own, or, what is perhaps even more trying, one may promptly find his carefully selected hue reproduced on a dozen different buildings, to which it may be inappropriate.

It is possible that in future days villages may be painted artistically to order, by contract, in sections that agreeably harmonize with each other, while affording some variety of general effect. At present the variations on the original yellow theme of colonial houses have reached a maddening variety, scaling from orange to straw color, with such intermediate shades of banana, and chrome, and lemon-yellow as happen to appeal to the proprietor's more or less educated eye.

This phase, too, is passing, but its succeeding fashion will also pass, and thus forever the old order changes, giving place to new, and while we are grateful to the wise ones who shed light upon our darkness, we mistrust the infallibility of any rule or any fashion as applicable to all situations, and all seasons, and seek for more light upon this difficult subject, which shows the same complications as the effort to make a

house serve with equal comfort as a winter and a summer dwelling.

Hingham, Mass.

M. C. Robbins.

Sweet Peas

To the Editor of GARDEN AND FOREST:

Sir,—Is it too late to plant Sweet Peas?

Albany, N. Y.

R. A.

[It is not too late in the latitude of Albany, but, as a rule, the earlier Sweet Peas can be put in the ground the more vigorous will be the plants. They should be planted just as soon as the ground can be worked in spring, and there need be no fear of injury from frost. The ground should be worked deep, say eighteen inches or even two feet, and fairly good garden-soil will give an abundant yield. It is well to plant thinly in a furrow some five or six inches deep, covering the peas with about three inches of soil and drawing the earth up to the plants as they grow until the bed is level. Give them tall brush or a wide trellis of wire-fencing to run upon and cut the flowers every day, and they will keep on blooming until frost.—Ed.]

Sand Dunes.

To the Editor of GARDEN AND FOREST:

Sir,—I should like to offer a plan for protecting water-fronts from shifting sand that suggested itself to me while examining a harbor on Lake Michigan.

In GARDEN AND FOREST (vol. iv., p. 503) Mr. J. B. Harrison speaks of the necessity of beginning near the water's edge. There may in places, however, be serious objections to planting the outer row of Cedar-saplings suggested by him. A quicker and cheaper plan would consist in driving sharpened boards, six or eight inches wide, and, according to circumstances, from three to six feet long, into the sand in a continuous row, thus making an obstruction that would catch the moving sand in drifts. As these boards become uncovered they could be driven deeper, and if buried could be raised by hand. In this way enough protection would be given that the spontaneous growths would be given an opportunity to gain strength, and it would be easy to make the shelter permanent by planting a close shelter belt behind this fence, if I may so call it. On the Lake Michigan shore the best deciduous tree would be the Balm of Gilead; it thrives well on exposed sandy shores, and could be cheaply propagated from ripe wood driven into the sand. The proper evergreens to plant with it are the White Cedar and the White Pine, the former for a permanent low screen, and the latter to eventually succeed the Balm of Gilead.

It can readily be seen that a screen of this character would cost very little. A couple of men could cut down Balm of Gilead or similar trees and cut them up into cuttings two or three feet long, and plant these very quickly. It would require about sixty-five feet of cull lumber per rod of fence. This lumber would cost, hereabout, not over forty cents. It would be interesting to know what it would cost to protect a mile of shore-front, and, if it has been tried anywhere, readers of GARDEN AND FOREST would like to hear the result.

Milwaukee, Wis.

Charles L. Mann.

The subject of the fixation and reclamation of sand-dunes is one which has attracted the attention of engineers in the Old World for years, and a large literature and record of experience exist; but of valuable works on the subject I know but one, the classic treatise of Joseph Wessely, *Der Europäische Flugsand und seine Kultur* (The European Shifting Sands and their Cultivation), Vienna, 1873, which, while treating the subject with special reference to local conditions in the desert of Hungary, yet enlarges upon the principles which rule everywhere, and should be in the hands of any one attempting the solution of such problems.

The difference between the shifting sands of the interior and those of the seashore is, that in the first case a great mass of sand is in question, which once fixed is fixed forever; while in the latter case the sea is constantly bringing up new material, and hence the work of fixation is never entirely done, and requires more or less constant watching and renewal. Mechanical works, such as fences, covering with brush, straw, turf, will be less effective and less per-

manent than a fixation by means of a plant-cover, the root-system of which penetrating in all directions will bind the sand as no mechanical appliance can.

To establish a plant-cover, however, it may be necessary to quiet the sand first temporarily, and to some extent artificially, before the planting is begun. The necessity for this and the means and methods will differ according to local conditions.

When dealing with sand-dunes at the seashore it is necessary to first cut off to some extent the supply of sand constantly brought from the sea. This is done by raising the shore or front with a tolerably steep grade, which, while having slope enough not to be endangered by underwashing, forces the waves to carry back the sand they bring up. This is most simply done by establishing an artificial front or forward dune. This forward dune is formed by running two parallel fences along the shore, made of brushwood hedge fashion, six feet apart, and so high that the top of each may be, say, eight to ten feet above average water-level. These hedges are braced up if necessary by post and rail, and are expected during the summer to catch the shifting sand between, in front and rear, and thus to form the forward dune.

Should this dune not be high enough to keep off the sea winds and their effects upon the sand masses beyond, especially if these are extensive, a second dune, the so-called "high dune," established in a similar manner, only higher and parallel with and behind the first, becomes necessary. To make the dune effective against the sand which is constantly added to it Sand-grasses are planted, which, as the sand covers them, grow through it to the surface, and keep the dune permanently in proper condition. The best grass for the purpose has been found to be *Ammophila arenaria*, which is easily and successfully transplanted. This grass is native along the Atlantic coast and the lakes, as well as in Europe. It has been used, I understand, to bind the sand of the Golden Gate Park, San Francisco.

When the shifting sand has been quieted, reforestation can be resorted to to keep it permanently and securely in place. For this purpose the Pine tribe furnishes, probably, most desirable material, although other kinds will grow where a fresh subsoil is present, especially Poplars and Cottonwoods, and some Willows, which are most easily propagated by cuttings. The choice of material might be indicated by the surrounding flora. Brush Willows and any other low shrubs have been found objectionable because they induce the formation of hillocks around them.

Above all, the dune must be constantly watched, and any small damage repaired at once, since small defects are very rapidly enlarged, and prompt action can prevent this.

Forestry Division, Washington.

B. E. Fernow.

Recent Publications.

The Study of Leaves. By Mary B. Dennis. D. Appleton & Co.

This little handbook is not an exhaustive treatise in which everything that is known about leaves is set forth in due order, but it is intended simply to help and encourage the acquiring of habits of observation by the young—that is, it does not attempt to tell children what other people have discovered, but it directs their attention to the proper way of finding out things for themselves. Very little, therefore, is said in the book about the physiological functions of leaves or their chemical constitution, as the primary purpose in view is to direct children how to look at leaves so as to describe and identify them. To this end there are something like a hundred blank schedules for leaf-analysis. The child is instructed that it is not necessary to know the name of a plant before its leaf can be analyzed, but that the first thing to do is to become familiar with its appearance. The first title in the schedule is "Arrangement." In one of the few preliminary pages it has been explained what the terms opposite, alternate, radical, whorl and fascicled mean, and there are excellent outline sketches to illustrate the explanations. What the child has to do then is to examine the leaf and write in the schedule the proper descriptive term for its arrangement. The leaf is studied in the same

way with reference to all the various items in the schedule, such as its venation, margin, surface and the rest, and when this has been done and the results recorded the student must have obtained a pretty distinct idea of the external appearance of the specimen. Besides this there are some short directions for pressing leaves, for drawing them, for painting them, and printing them and skeletonizing them. Altogether the little book can be thoroughly commended to parents and teachers, and the child who begins the study of leaves in accordance with these directions, and pursues it with ordinary diligence during the coming season, will have acquired not only some knowledge, but what is much better, the habit of getting knowledge which will be retained through life.

The Plant World; its Past, Present and Future: An Introduction to the Study of Botany. By George Masee. New York, Macmillan & Co.

The author of this little book is the lecturer on botany to the London Society for the Extension of University Teaching, and it is another of the numerous attempts to furnish instruction to everybody in all branches of science. It contains seven chapters, the first of which is entitled Plant Architecture, and attempts to give the various uses of the different organs of plants, the modifications of these organs caused by external agencies and their microscopic structure. Then follows a chapter on the chemistry and physics of plant-life, and another on the arrangements for protecting various plants against climate, living enemies and waste of energy in the struggle for existence. A treatise on the reproduction of plants follows this, and then comes a chapter on the relationships of plants, which includes a discussion of the leading problems in systematic botany. The last chapters are devoted to history and geography, in which the distribution of plants and their evolution from the vegetation of early geological periods is discussed. All this is comprised within two hundred brief pages, and while the facts are clearly stated the book can hardly be considered as an effective introduction to botanical study. The proper introduction to botany is the study of plants, and while the facts which are here collected are very useful as references to persons who have some acquaintance with the science, this is not the kind of a work to put in the hands of beginners either as an aid or an encouragement to botanical study. The information given is such as persons of ordinary education might wish to possess, and persons who have some rudimentary knowledge of botany will find much enjoyment and profit in the book. It is not sufficiently complete for the specialist, on the one hand, though it may suggest to him at different points some interesting line for research, nor is it a book for beginners, at least not a book for young beginners. It belongs to a class of books, however, which is multiplying very rapidly in these days, when the work of popularizing science is considered so praiseworthy. If this phrase means the explanation in popular language so far as this is possible of the more important truths and principles which men of science have discovered, the object is certainly commendable. So far, however, as their leading purpose is to enable the student to obtain a knowledge of some science without personal study and investigation, they must always prove disappointing.

Notes.

Professor Halsted has sent out his check-list of American weeds, amounting to 751 species and varieties, without including those in sub-tropical Florida. There is a special list of one hundred of the worst or most annoying species.

The manual issued by the B. A. Elliott Co., of Pittsburgh, and entitled *A Few Flowers Worthy of General Culture*, is considerably more than a price-catalogue. It is beautifully printed, and some of the illustrations are unusually soft and delicate.

For hanging baskets the drooping Maiden Hair Ferns are not used as freely as they might be. Of these *Adiantum dolabrifolium* and *A. ciliatum* are especially adapted to basket culture by their habit. The second one will endure a much cooler temperature than the first, and is very distinct and elegant in appearance.

It is reported from Chicago that material for the horticultural display at the Columbian Exposition is beginning to arrive in large quantities from abroad. As an example it is stated that H. Cannell & Son, of Swanley, England, have sent one hundred varieties of herbaceous Pæonies and a large number of perennial Phloxes.

Mr. E. S. Nadal's interesting article on the "New Parks of New York," published in *Scribner's Magazine* for April, gains especial value from the accompanying map, as few persons even in New York realize how large are the areas set apart for public enjoyment, how diversely they lie, or what will be the extent of the proposed parkways connecting them.

In the last number of the *Gardeners' Magazine* Rev. G. H. Engleheart pronounces the White Trumpet Daffodil, Madame De Graaff, as perhaps the finest existing Daffodil. It is very large, of great substance, and is said to be a seedling from the Empress of India by the pollen of Albicans. It was introduced some three years since, but we believe the price is still a guinea a bulb.

During the past season twenty-four field meetings have been held by the Torrey Botanical Club, of this city, with an average attendance of twelve persons. One of the most interesting results of the year was the listing of all the plants on Sandy Hook, New Jersey, which was visited on July 25th. *Asplenium platyneuron*, a Fern which usually grows in rocky spots, was here found flourishing in pure sand, and among introduced plants *Lactuca Scariola* was noticed.

The Superintendent of Parks in Brooklyn says that Prospect Park "is visited by nearly thirteen million people annually, for its attractions alone, because it is little used as a thoroughfare between different portions of the city, as is the case with many other parks. During a storm the park is deserted by every one except the guards, but within half an hour after the skies clear the roads are covered by carriages, or, in winter, by sleighs, while snowflakes still linger in the air."

"No garden in Japan," says a recent writer, "is considered complete without its group of Maple-trees placed beside some artificial hill toward the west to receive additional splendor from the setting sun. Grassy slopes and valleys are planted with these trees, with the object of bringing into one limited prospect the red and golden tints in which the natural scenery of the wooded hills abounds. Picnicking and mushroom-gathering are pastimes which accompany the viewing of the Maple."

Arbor Day is now celebrated in Nova Scotia and New Brunswick, and in the *Educational Review*, published at St. John, an editorial on the observance of the day closes with some sensible suggestions like the following: Work should be the most important part of the programme; few trees should be planted, but they should be planted well and with careful preparation beforehand; school premises should be cleared up and beautified; the fatal mistake should be avoided of supposing that everything is done when Arbor Day is over.

In a bulletin just issued by the Experiment Station of the State Agricultural College at Michigan, Professor Taft, the horticulturist, reports on a test of different varieties of Strawberries last year that the most promising early sorts are Beder Wood, Lovett and Van Deman, while Haverland, Pearl, Parker Earl and Bubach No. 5 are the best which follow soon after. Of late sorts Belle, Florence and Gandy succeed the best. Of the newer Raspberries, Cromwell, a seedling from Connecticut, is in most respects similar to Souhegan, and thus far has proved more healthy and somewhat more productive. Of the late varieties, Royal Church, from Ohio, is one of the best.

Some tests made at the Kentucky Agricultural Experiment Station show that the Bordeaux mixture may be effective as an insecticide. Potatoes, which were infested and injured by the Flea-beetle (*Crepidodera pubescens*) were sprayed with the mixture, and the injury by insects was promptly checked. As new leaves unfolded between the sprayings the beetles would gather upon them, but were driven off as soon as the plants were sprayed again. The March blister-beetle, which appeared later in the field, avoided entirely the plants which had been sprayed, and although they occasionally gnawed the leaves of plants after the lime and copper had been washed off, it was plain the mixture could have saved the crop from most of the injury inflicted by these two beetles.

In an address read before the Wisconsin Horticultural Society, Professor Goff urges the young towns and villages of the west to set apart public pleasure-grounds before it is too late. He suggests that every village have its park, which shall be regarded from the beginning as an adjunct of the school, and be located sufficiently near the school-house to make it easy of access by the boys and girls. If the trees and shrubs are labeled with their common and botanical names the park will have a greater educational value, and if the planting is done with some ceremonies in which the young people can play a conspicuous part they will take more interest in it, and there will be less trouble experienced in securing from their parents

the money needed to maintain it, and this trouble will become smaller and smaller as the years roll on.

The *Journal of Horticulture* prints a list of varieties of Chrysanthemums, arranged according to the number of times each one was used at the exhibitions of the Royal National Chrysanthemum Society last year, and the average for seven years past. In comparing the first twenty-four on the list last year with the first twenty-four on the list in 1885 it is seen that very few changes have taken place—that is, all the favorite exhibition flowers of seven years ago remain favorites still. An examination of the relative positions occupied by the leading varieties during the last seven years shows no indication of decline in any of them. Among the incurved varieties the Empress of India has regained the first place, and among Japanese varieties Etoile de Lyon still holds the place it secured last year at head of the list.

The power of trees to regulate their own temperature to a certain extent is seen in the fact that their twigs are not frozen through in winter, nor does their temperature increase in summer in proportion to the temperature of the surrounding atmosphere. Their vitality protects them from both extremes. The bark is a bad conductor of heat, and is to a certain extent the clothing in which the plant is wrapped. Then the surface evaporation of the leaves produces in summer a freshness in them, and we know how cool they feel even on hot days. Evaporation, however, does not explain the coolness of many kinds of fruit that are enclosed in a hard envelope, through which evaporation seems almost impossible. The juice of a fruit grown by the Ganges is said by Hooker to be of a temperature of seventy-two degrees, Fahrenheit, while the sand in which it grew was found to be from ninety to one hundred and four degrees.

In the last number of *Insect Life* it is reported that the potato-tuber moth, which has been very destructive for many years in New Zealand, Australia and Algeria, has reached this country. Specimens received at Washington from Kern County, California, have been identified by Professor Riley. It was at first supposed that the insect had been accidentally imported on some of the steamers from New Zealand or Australia among the stewards' supplies. Later information, however, is that they were obtained from a Chinese gardener, so that it is not improbable that the insects were imported directly from China. The larvæ of this moth bore into the potatoes while they are still under the ground and after they are stored, and as much as three-fourths of the crop has been destroyed during a single season in Algeria. Strenuous efforts should be made to stamp out this pest before it obtains a foothold, and the immediate destruction of all infested potatoes is recommended.

Professor Kedzie sums up the results of experiments with Sugar Beets in Michigan last year, from the farmer's standpoint, that the outlook for the beet-sugar industry promises well over a large part of the southern half of the state. Some of the considerations which should incline farmers toward this industry is that the crop promises large cash-money returns, a good home market, and a concentrated product which costs little for transportation. Beet-raising properly conducted does not exhaust the soil, for the materials removed in sugar are only carbon and water, there being no nitrogen or potassium or phosphorus carried off, as there is in wheat. Besides this, the proper cultivation of Beets is the best preparation for a grain crop. In order to keep the soil from exhaustion the waste parts must be directly or indirectly returned to the fields. The tops and crown, not used in manufacturing, and the beet-pulp from which the sugar has been extracted are excellent cattle feed. In this way stock-feeding is a necessary part of the routine in a sugar-beet farm, and so is the rotation of crops. Beet-raising therefore compels thorough cultivation and good farming, which is a strong point in its favor. From the manufacturer's standpoint, it should be considered that a Beet-sugar plant is very costly, and that every device to reduce labor, save cost and turn out the largest and best product must be used when entering into competition with an established industry in the Old World. Americans now have a bounty of two cents on a pound, but they must contend with the experience and accumulated machinery of a half-century of beet-sugar-making in Europe. No such manufactory can succeed without an experienced and competent director, without abundance of good water, cheap fuel and transportation facilities, and unless it is located in a district with a suitable soil and climate which can be trusted to furnish 3,000 acres of Sugar Beets a year of good quality. In view of these facts manufacturers are cautioned to go slow.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLES:—The Sequoia Reservation.....	193
The Love of Nature.—I.....	193
Notes of a Summer Journey in Europe.—XIII.....	J. G. Jack. 194
Flowers in Town.....	Mrs. Schuyler Van Rensselaer. 195
FOREIGN CORRESPONDENCE:—London Letter.....	W. Watson. 196
PLANT NOTES:—Some Recent Portraits.....	197
NEW OR LITTLE-KNOWN PLANTS:—Miltonopsis Bleui splendens. (With figures.)	W. Robinson. 197
CULTURAL DEPARTMENT:—An English Daffodil Farm.....	V. C. 198
Hardy Ferns.....	S. F. Goodrich. 200
Shading Greenhouses.....	J. N. Gerard. 200
Tomatoes from Immature Seed.....	201
Early Spring Flowers.....	John Bell. 201
THE FOREST:—Timber-culture in Eastern Nebraska.....	E. J. Hill. 201
CORRESPONDENCE:—Transplanting the Trailing Arbutus.....	Robert Ridgway 202
Easter Flowers in Philadelphia.....	W. H. Taplin. 203
Spraying Machines and Insecticides.....	Albert Salisbury. 203
The India-rubber Tree.....	M. 203
Insects on Cherry-trees.....	T. G. 203
NOTES.....	204
ILLUSTRATIONS:—Miltonopsis Bleui splendens, in the collection of Mr. F. L. Ames, Fig. 30.....	198
Miltonopsis Bleui splendens, in the collection of Mr. F. L. Ames, Fig. 31.....	199

The Sequoia Reservation.

LAST week we spoke of the efforts of a railway lobby to secure a right of way through Yellowstone Park. We might have added that every one of the forest-reservations which have been set apart for public use under the President's proclamation is threatened with invasion of one kind or another. When the Yosemite Valley was dedicated to public use there was a strong protest by men who hoped to use it for their personal profit. When it was found necessary to enlarge the reservation, so as to save the streams which flow into the valley by protecting the forests about their sources, the protest was still more energetic. Unless this area was included in the reservation, it was very plain that these highlands would soon be stripped of their timber, and this extension of Government control injured no one but unlawful trespassers. The land can never be subdued to agricultural use, and some of the mountains included in it rise above the timber-line. But the men who were selling timber which belonged to the Government, and the sheep-herders, who were setting forest-fires every year in the hope of benefiting the pasturage to which they had no right, were up in arms at once.

The big trees south of the famous Mariposa group have already been attacked, and one of the most important groves was taken possession of by a colony for the purpose of working them into timber. These wonders of the forest are a part of the nation's inheritance, and the trees are worth infinitely more as they stand than they would be when cut down and sawed up. If they are preserved they will draw visitors from all parts of the country and all parts of the world, and in a purely business point of view they would in the long run bring more money into the state as a natural attraction of unparalleled beauty and grandeur than they could in any other way. For the past year they have been protected by detachments of the army, which, under national authority, patrol the reservation. The

lawless men who covet the timber of these great trees have become enraged because the Government is undertaking to preserve the people's property. The California papers contain accounts of active efforts now being made there and in Congress to reduce the area of the reservation, and the sheep-herders are complaining that they have been deprived of their rights. A convention of the sheep men of three counties has lately been held for the avowed purpose of procuring the repeal of the act establishing the Sequoia Reservation, and it is well for the people and for Congress to know that if they relax their vigilance fires will again be sweeping through these forests and saw-mills will soon begin their desolating work.

No wrong has ever been done to a lumberman or shepherd by establishing these reservations. No man has a claim to pasturage on Government lands, still less right has any one to cut down the trees which belong to the people, or to kindle fires which will destroy not only the forest as it now exists, but all hope of forests in the future. The agitators for unlimited sheep-ranging boldly denied in convention all the truths in regard to the beneficent influence of forests which have been established by centuries of human experience. They asserted that the streams would continue to flow as evenly without forests as with them. They denied that the trampling and browsing of animals injure the growth of the woods. They even denied that fires are ever kindled in the interests of these sheep-herders, although every one who has ever been in California knows better. What they really want is full opportunity to steal the timber from the Government forests and to get rich by pasturing their flocks on Government land, where they are sure to do incalculable damage.

It is not probable that the Government will think of abandoning these forests, or any part of them, in obedience to a preamble and resolutions passed by a convention of would-be trespassers. But it is important that the people of the country should realize the need of constant watchfulness if these reservations are to be saved. Attacks upon them, open or insidious, may be expected at any time. The men who organize these attacks know just what they want and the most promising schemes for obtaining their ends. The individuals who take active interest in them, on the other hand, are few and scattered, and the reservations will never be permanently safe until their value is generally recognized throughout the country. No one will dare to attack them when an affectionate regard for them has become a universal public sentiment.

The Love of Nature.—I.

ALL human beings draw pleasure from nature in the rudimentary sense of enjoying fresh air, sunshine and a free open outlook. Every one prefers a bright day to a gloomy one, and a balmy air to harsh tormenting winds; and almost every one will confess that a green landscape is pleasanter to look upon than grimy streets, even though he may have good reasons for preferring a town as a place of residence. Such likings as these, however, prove no real love of nature. They are almost purely physical; they betray no more sentiment than the animal which is pleased when basking in the sunshine.

But the great majority of people, even among those whose minds are uncultivated and who do not practice the common proprieties of life, have a deeper feeling for nature than this, and can appreciate something of its true beauty. Stupid and brutalized indeed is the man or woman who does not notice a brilliant flower, or who would not be impressed by the view of a mighty mountain chain. On Sundays our parks are crowded with laboring people, who spread through every quiet walk and shadowy glade, and like nothing so well as to saunter or lie upon the grass; and although part of their pleasure is simply physical, any one who has sympathetically mingled with them knows that a great deal of it is of finer quality. The beauty of the

surrounding scenes impresses even the dullest eye and appeals through it to the most sluggish imagination. Even the roughest dweller in the tenement-house district admires the shores of the Hudson River when he sees them on some summer excursion, and is impressed by the beauty of the sea when for the first time he stands on a beach where giant waves are breaking.

This instinctive admiration for the beauties of the natural world is what many persons understand by the love of nature. But it is not, in the truest sense, the love of nature. It is distinctively a love for natural things which are beautiful, of course, but which are also unfamiliar and therefore striking. Let the dweller in tenement-houses inhabit a lodge in the Central Park for a while, and he might seek his Sunday entertainment in a down-town street. Let him work on a North River schooner, and he would quickly forget to notice the beauty of the shores. The same attitude toward nature can be observed in the case of persons of wider cultivation. Familiar natural features soon grow uninteresting. The artisans who crowd the park on Sunday enjoy its unfamiliar beauty more truly than most of the wealthier folk who drive there almost daily. It is curious, indeed, to see how few of these turn from the fashionable East Drive into the much more beautiful West Drive. And it is still more curious to find that hundreds of New Yorkers, who have made pilgrimages in search of natural beauty from the Nile to the Sierras and from the St. Lawrence to Mexico, have never left their carriages to see what the pathways in their own park might reveal. The Ramble is as unknown to them as if it lay in China, and they exclaim with surprise when you tell them that they might travel a thousand miles and see nothing prettier.

What people of this kind usually care about is not nature itself, but those conspicuous natural effects which are called scenery. Scenery is not the whole of natural beauty; it is only one manifestation of it; and a person who delights in a magnificent view, but finds all flat regions hopelessly tiresome, or who feels the grandeur of a rocky coast, but not the loveliness of a green-fringed quiet shore, does not really love nature. His attitude is like that of one who should profess to love flowers, but, while admiring a Rose, should despise a Forget-me-not. The true test of a love of nature is that one who gives interested attention to all natural effects and forms, and finds beauty where the average eye sees none.

Of course, there are grades and degrees of natural beauty, and for each grade the true lover will have the corresponding amount of admiration. He will not call a Belgian plain as beautiful as the valley of the Rhone, or declare that a Nettle has the charm of a branch of Apple-blossoms. But there are few plants which have no beauty of any sort; and there are few spots on earth where man's hand has not obliterated Nature's intentions entirely, so wholly devoid of charm that the sensitive eye and mind cannot enjoy them keenly.

Admiration, says a French writer upon art, "is the active æsthetic form of curiosity." And this means that he who really admires the works of God will be lovingly curious about the Hyssop on the wall as well as about the Cedar of Lebanon; will see more to please him in a rough bit of pasture-land than the average person sees in a whole fertile valley. Who can love nature better than the landscape-painter who spends his whole life in transferring its beauty to canvas for the instruction and pleasure of his fellow-men? But no one is less in need than the landscape-painter of what is called scenery. It is not he who greatly prefers the cañon of the Yellowstone to the banks of the little river near his home. When he is brought to face magnificent scenery he experiences keen delight, but he gladly comes back to his quiet plains, his placid pools, his little forest-glades. Nor is it merely because these things are better fitted than grander things for transferring to his canvas. His own small corner of the world is enough for him, as a thing to enjoy no less than as a thing to paint. Delacroix was not a landscape-painter, and so cannot be

suspected of looking at inanimate nature with an eye for good subjects; and there has never been a painter whom we could more easily credit with an inborn love for striking and even spectacular kinds of beauty. But fine scenery was not essential to his enjoyment of nature. "The poorest little alley," he wrote one day from a shabby suburb of Paris, "with its straight little leafless saplings, in a dull and flat horizon, can say as much to the imagination as the most bepraised of sites. This tiny cotyledon piercing the earth, this Violet shedding its first whiff of perfume, are enchanting. I love such things as much as the Pines of Italy."

This is the voice of the true lover of nature, and like it was Corot's voice, which constantly praised not the grandeurs which he had seen on his travels, but the tender, subtle beauties around his home at Ville d'Avray, and, more than anything else, the humblest of them all, "my leaves and my little birds." If one is born to love nature, or learns to love nature, as these great men did, and as all true artists do, the quietest scenes are impressive—the most familiar are ever new. A Blackberry-vine trailing over a gray rock gives one an emotion as delightful as the sight of a giant mountain; and custom cannot stale one's pleasure, for it is as infinitely varied, as perpetually renewed, as the leaves on the trees, the blades of grass in the field, the tints in the sunset sky.

Notes of a Summer Journey in Europe.—XIII.

THE Botanic Garden at Brussels is probably most famous and best known through the work and writings of its present Director, Professor F. Crépin, the distinguished rhodologist, who has made the species of Roses a special study for thirty years. It is very nearly a hundred years since the first botanic garden was established in this city, and it was for a time an adjunct to the School of Medicine. The site of the garden of to-day was acquired in 1826 by a private association having the name of the "Royal Society of Horticulture of the Low Countries," which was changed eleven years later to its present title of the Royal Society of Horticulture of Belgium.

The garden passed through several periods of success, misfortune and embarrassment until 1870, when it became the property of the Government, and it is from this time that it has taken high rank as a scientific institution. Previously, being private property, it was of comparatively little use to the public, and the work carried on was chiefly horticulture pure and simple. The total area of the garden is only about sixteen acres, but, although it is not so large as some others, it takes rank among the best-kept and best-equipped public gardens in Europe. But it is not given so much to the formation of a collection of rarities or novelties as it is to furnishing a fair representative and instructive botanical collection within its small area. The aim has been to get typical examples of the different genera and to introduce the most remarkable species, preference being given to those which are native.

In addition to the open-air collections, those of the green-houses contain a larger and more varied assortment than might be expected, and in very good order. These, added to the botanical museum and valuable herbarium, afford excellent opportunities for study by students of the university and others. The *Victoria regia* house contains some very fine specimens of the great Amazon Lily and also a good representation of other aquatic plants.

The larger portion of this botanic garden is as freely open to the public as is compatible with good order, and it is as freely used as a park by the populace. A small portion is given up to the "School of Botany," or a collection of plants, arranged according to the classification of Dumortier, which is available to all regular students and those really interested in the study of plants from the botanical standpoint. Plants of a tender or alpine nature are often protected from the hot rays of the sun by small wicker hood-like screens about two feet in height.

A portion set apart as a "School of Floriculture" is designed to furnish practical information about live plants to gardeners, florists or any who may be at all interested in a garden, and it is freely open to the public. Into this collection the most notable of the new introductions are annually introduced, so that the amateur may see and appreciate the merits or demerits of a novelty before purchasing it for himself. Some of the beds make a handsome show, and the condition of the plants goes

far to prove that botanical science and instruction and good cultivation may all be accomplished together. Too often botanical collections are mere aggregations of species and give little idea of the capabilities of the individuals under favorable conditions or good cultivation. There are enclosures devoted to collections of officinal and poisonous plants and to those of economic value as food or in manufactures, all such being grouped together which have the same peculiar value.

The small area of the garden precludes the possibility of establishing an arboretum or systematic collection of trees and shrubs, but a considerable number of species have been massed together on the western side. Conifers, apparently, do not thrive. A system of instructive labeling has been introduced here, which has been copied at Copenhagen and perhaps other places. The labels are made of heavy sheet iron, those of an average size being cut a little over six inches wide and nearly nine inches long. They are painted, and the family, botanical name (and chief synonym, if any), common name and habitat are given; and on the same label, immediately underneath the foregoing information, a map of the world is neatly painted, which shows the geographical distribution of the species. These labels are very neat, and are said to endure exposure for many years without material injury or effacement. They cost from about thirty to sixty-five cents each, according to the size and amount of work required, and they may be procured by application to officers of the garden. This form of label would be rather too costly for most botanical establishments, and for all practical purposes the name of the native country of the plant should be sufficient.

The species of Roses in the garden have a particular interest because they are the special study of the distinguished Director. I noticed among them the true *Rosa foliolosa* of the south-western states, although here growing less vigorously than at the Arnold Arboretum. This little Rose is extremely rare in cultivation, and the plants under this name sometimes belong to some other common species. The occasional flowering throughout the summer of *Rosa rugosa* is here considered as simply an accidental, and not a reliable, character. But *R. Indica* is a true remontant, and a hybrid of this and *R. rugosa* is found to be quite hardy here. The flowers are white, fairly double, fragrant like *R. rugosa*, and the blossoms are produced continuously. The foliage and habit are somewhat like those of *R. rugosa*.

The principal large park in the city is mainly shaded by fine Beeches and English Elms, but Horse-chestnuts, Maples and Lindens also enter into the composition. It is surrounded by a double row of the broad-leaved Linden (*Tilia platyphyllos*), planted uniformly apart, with their trunks free from branches for twelve feet, and with the tops squarely clipped off at eighteen feet from the ground. The branches of the trees in the rows are interlaced, while the sides are cut hedge-fashion. In short, the whole thing might be called a hedge raised twelve feet in the air, and it is an example of a once popular kind of tree-pruning still often met with in many French towns.

In the Place du Petit Sablon I noticed another relic of a fashion which years ago came into vogue in some parts of Europe, and a hint of which is shown when flower-beds are ornamented with shells, light-colored stones, and the like. A number of small formal beds are arranged with lines of dwarf Box, *Sempervivum* or Feverfew, the intervening masses being filled with evenly broken small sandstone of two kinds, one being of a grayish color, and the other reddish. These are thickly put on the ground alternately with each other, or with the plants. At a little distance the result is quite deceptive, and equally effective as would be the use of the more expensive *Sempervivum*. The broken sandstone is also used as borders to formal beds. The practice will commend itself to those managers of public gardens, squares and cemeteries who are economically minded, but have a mania for formal designs, such as geometrical figures, monograms or names.

Arnold Arboretum.

J. G. Jack.

Flowers in Town.

IT is hardly possible now to draw that distinction between hot-house flowers and garden flowers which was formerly so clearly marked. Not many years ago few plants were grown under glass in winter which could be grown outdoors in spring, summer or autumn. Greenhouses were kept chiefly for exotics, and women were content to adorn themselves, while snow lay upon the ground, with such flowers only as nature had originally given to their sisters of other lands. When Roses were out of season, they wore Camellias; and while waiting for the spring to make the bulbs blossom in their flower-beds, they filled their conservatories with importations

from the Cape. Now, however, it would be impossible to feel sure, from the flowers in our drawing-rooms and our florists' windows, what the season of the year might be. While utilizing the resources of other climes more fully than ever before, we have also transplanted our own summer gardens indoors; and every year an interested observer may notice new favorites from the border, and even from the roadside or the woodland glade, contentedly blooming in the florist's shop in winter and in especial variety as Easter approaches.

Persons who are not yet middle-aged can remember their surprise at seeing for the first time Lilacs and Lilies-of-the-valley before the snow was off the ground; yet now even the street-venders offer them to us. Until I was grown up, I never knew what a Daffodil was, because I always lived in New York in the winter and spring, seeing the country only when Daffodil-days were well over. "Early spring flowers" meant to me, in my childhood, nothing earlier than buttercups and daisies. But the city child is more familiar with the sight of Daffodils than most of her country cousins. Violets are easier to get in midwinter than in spring, and Roses are common all the year round.

This year, long before Easter-day, our streets were gay and redolent with spring and summer flowers, some of which it was very hard to believe had been raised in greenhouses with a definite idea of pecuniary gain. We have got accustomed to associating the traditionally modest Violet, beloved of the spring poet, with winter festivities, and it now seems as much a flower of the ball-room as of the woodland. But the still more modest Forget-me-not is yet instinct with sentiment, connecting it with brooks that wander through open fields and nestle into pools beneath the shadow of young-leaved Willows. Were these Forget-me-nots, which lay on the street-vender's bench while winter lingered in the air, really grown near at hand in artificial warmth, or had they been brought on the wings of a gracious wind from some softer southern clime? And the Lilacs themselves, were they really not yet in bloom on Long Island? Were not these outdoor-looking sprays of white and purple broken off recklessly by bare-foot boys standing on the fence, but carefully cut by a gardener's shears in a carefully heated house?

Still more surprising was it to see true denizens of the wild-wood blooming in pots as placidly as though they were Camellias. It was, indeed, a proof that our own country had come to town as well as that eastern lands had come west and tropic lands had come north, to be able to choose, for an Easter gift, between gorgeous Orchids, Bermuda Lilies, veritable Azalea-trees and blossoming shrubs of Mountain Laurel.

I have heard people say that it is a pity things have changed in this fashion. They feel that it is best, for the sake of securing that variety in our pleasures which means a perpetual freshness of interest, to limit ourselves in winter to the thousand exotics which we can get by artificial cultivation only, and to leave our own spring to bring us its own treasures in their turn. And they feel that this is best, also, for the sake of preserving that sentiment with regard to flowers which plays so great a part in the delight they give. They would have us render unto spring the gratitude that is spring's, and not forestall and cheapen it by thanks bestowed upon the clever gardener. They would have us recognize the procession of the seasons by not disturbing the natural procession of the flowers, and mark our months, as the Japanese do, by the special enjoyment of the special offerings of each.

But people who feel thus, I think, are usually those who live all the year round in the country, and when they come to town to see what we are about can afford to pity our confused, un-sentimental way of mixing up Nature's bounties, sure themselves of receiving these bounties, gradually but continuously, in their true and most beautiful sequence. Or else they are persons who at least can leave town when they choose and watch not merely the Daffodils unfolding but the fuzzy gray buds swelling on the Willow-bushes.

To others who, like myself when I never saw Daffodils, spend only two or three summer months out of town, a confusing of Nature's sequence of gifts cannot matter so much. To them who never see the grass growing green except in a park, and who in a park cannot tell which early flowers have been transplanted from the hills just across the river, and which have been brought from across the sea, such flowers do not wear the associations that they wear for country-bred eyes. It matters not to them whether they first see Lilacs or Hyacinths, for they do not know which would bloom first out-of-doors. What they are chiefly concerned with is to see them both as soon as possible, and as many of them both as they can. It may be shocking, from the rural point of view, to as-

sociate Daffodils rather with a dinner-table in February than with a garden-border in April, and Lilies-of-the-valley with winter weddings rather than with dewy mornings in early summer. But how can they help it? And, deprived as they are of the better part, why should not they fill their lives as full of beauty as they can, even though Nature's processes be artificially forced, and Nature's order of things almost reversed? They cannot grow their flowers, or even watch nature grow them; and if they must buy them, ignoring whence they come, it cannot matter much whether they come from under glass or from under the greenwood-tree.

However, whether it is "right" or "wrong" to anticipate the seasons as we city folk now do with the help of the florist and his greenhouse, no one will question that it is right to bring the country to town in another fashion which has likewise developed vastly in very recent years. Surely it is an unmixed pleasure to think that no city child need now ignore the fact when the first spring wild flowers really begin to blossom a little way out of town, or when New Jersey gardens are at their best. Scarcely any wild flowers or common garden flowers came to us, even in their proper season, a few years ago. Now all the familiar kinds come, and not flowers alone, but the first hints and promises of flowers, and autumn witnesses that flowers have been. Pussy Willows come first, and budding sprays of shrubs that will bloom out in water, and then Marsh Marigolds and Trailing Arbutus and Jack-in-the-pulpits and Apple-blossoms, and so on to the outdoor Lilacs and Daffodils, cheapened now within reach of the slimmest purse, and the Mountain Laurel, not now in little pot-grown shrubs, but in big and splendid branches, and Swamp Honeysuckles and Daisies and Buttercups and bunches of Clover; and so on and on until summer is over and the wild flowers and common garden flowers are gone, and the bunches of Black Alder-berries come, and the streets are full of Chrysanthemums, and the reign of forced and coddled, coaxed and transposed greenhouse productions begins again. Truly, if our florists' windows now defy and contradict the calendar of the seasons, there are many months when our streets illustrate this calendar faithfully for any eye that knows how to interpret the pictures which Flora draws.

New York.

M. G. Van Rensselaer.

Foreign Correspondence.

London Letter.

UVA GRASS.—The following inquiry comes from a Californian correspondent: "Will you kindly inform me of the name and habitat of a gigantic grass of which I forward a few sprays? It is not grown here, but is imported and sold in a dry state under the name of Uva plumes. The plume itself is monstrous, being four or five feet long. The sprays droop entirely on one side, reminding one of the fleece of a Cashmere or Angora goat. The people who furnish the plumes in Europe will not give the name of the grass." I received a similar inquiry from an English correspondent nearly four years ago, and found that the plumes were then offered for sale by London florists under the name of Uva Grass. How they were obtained is not quite clear, some stating that they came from the Congo, others from India. On comparing the plume at the Kew herbarium it was found to be the male inflorescence of *Gynerium saccharoides*, a gigantic reed which grows on the river-banks of Cumana in Venezuela, and in Brazil. It is one of the most beautiful of all tropical grasses, the stems being twelve feet long, an inch in diameter, with leaves five feet long and one inch in width, the edges serrate and channeled along the midrib. In habit the plant is not unlike *Arundo Donax*. The panicle is terminal, at least four feet long, copiously branched and plume-like, the branches a foot and a half long and clothed with small flowers, which, when dried, are gray-brown in color. The plumes sold in the English shops are six feet long, including the stalk; they are extremely elegant and feathery, but are sometimes disfigured by dyes of various colors. There is a large plant of this grass in cultivation at Kew. It is grown in the tank which in summer contains the *Victoria regia*, and is as striking in appearance as some of the Bamboos. No flowers have as yet been produced by this plant. It is probable that the plumes sold in London, and also, apparently, those now sold in America, are imported from Brazil.

Some of the plumes were among the exhibits from the island of Dominica at the Colonial and Indian Exhibition held in London in 1885. It is by no means unlikely that this *Gynerium* could be grown in the southern states, particularly Florida. I have never seen or heard of any other plant in cultivation in Europe except that at Kew, which was imported direct from Venezuela about fifteen years ago.

SARRACENIAS AS FLOWERING PLANTS.—It is probable that you know a great deal more of the decorative value of *Sarracenia* than we do here. They are not by any means popular with us, being generally classed among botanical curiosities. But a well-grown and properly colored specimen of *S. Drummondii* or *S. flava*, or even of *S. purpurea*, is, in my opinion, an object of very considerable beauty apart altogether from its peculiarities of structure. We have numerous hybrids and seedlings of *Sarracenia* now, and at Kew there is a good representative collection of both species and varieties. They are grown in pans in a well-aired sunny greenhouse, except for about a month in early spring, when, after repotting, they are placed in a stove temperature and exposed to all the sunlight possible. Of course, they are kept very moist always. Under this warm treatment the new leaves, which are developed in March and April, grow rapidly, and lay the foundation for brilliancy of color in autumn. With the new leaves the flowers are pushed up. Hitherto we have removed most of the flower-buds to further the growth of the pitchers, but this year we left them to expand. They have been quite sensational, many of the flowers being five inches across. In form they vary somewhat, and in color they range from cream-white to bright yellow and rich crimson. These flowers are as pleasing as the most elegant Daffodils; they are fragrant, and last a week, at least, in water, and their colors are good. *Sarracenia* certainly deserve to take rank among first-rate flowering-plants for the greenhouse. I have never seen a *Sarracenia* grown out-of-doors in England that was satisfactory, nor have I seen imported wild plants with pitchers as fine as they produce under cultivation.

THE WEATHER here for the last week or so has been as exceptionally warm and sunny for April as it was previously cold and dull. The consequence of the change is apparent among the early-flowering trees and shrubs in the open air. Almonds, the most beautiful of all spring-flowering trees, and a common street-tree in the London suburbs, besides early Cherries and Plums, are already laden with flowers. *Forsythia suspensa* is a cloud of lovely yellow bloom, beautiful almost beyond comparison as a bush, and even more attractive when trained against a sunny wall; *Acer rubrum*, with its clusters of bright crimson flowers, *A. hybridum*, with its yellow clusters, and several others are now attractive. *Parrotia Persica* is even better than the Red Maple, several plants of it at Kew being now thickly laden with clusters of rich red flowers. It is a beautiful tree in leaf, and in autumn it assumes the richest colors before the leaves finally fall. The early Rhododendrons, such as *R. Dahuricum* and *R. Nobleanum*, are bright with flowers in the open borders. The rich mauve-purple of *Daphne Mezereum* is seen to advantage when the plants are grown in large groups, two round beds of it twelve feet across, and each containing about twenty-five plants two feet high, and nearly as much through, being especially effective. The small alpine *D. Blagayana* is also in flower on the rockery. *Pyrus Japonica*, in its several varieties, is in full bloom, the most attractive, on account of its rich blood-crimson color, being that called *Moerleesii*. The Daffodils on the lawn are again a "waving sea" of yellow. The Crocuses, now over, have been equally showy. They are from the bulbs which had been used for forcing, and instead of being thrown away they were planted in grassy slopes on the lawns.

FLOWERS IN APRIL.—The supply of these for the English, and especially the London, market comes from Italy, France, Belgium, and our own small islands in the south,

as well as from the English gardens proper. It is interesting to find quantities of the feathery *Mimosa* (*Acacia dealbata*), *Richardias*, *Anemones*, *Lilac* and *Wallflowers*, all, or nearly all, from foreign sources. Orchids are gaining ground yearly as market flowers, considerable variety being now obtainable at the stalls. Good *Cattleya*-blooms can be purchased for sixpence, and *Odontoglossum crispum* for threepence each. *Dendrobiums* of several kinds are generally abundant, *D. nobile*, perhaps the best of all species, being very largely grown for the English flower-market. *Liliums*, *Daffodils*, *Tuberoses*, *Eucharis*, *Freesias* and *Gardenias* are generally abundant, and consequently cheap. Of course, *Azaleas*, *Camellias*, *Roses*, *Carnations*, *Hyacinths* and *Tulips* are sent in enormous quantities almost every day.

INTERNATIONAL EXHIBITION OF FRUIT.—This exhibition will be held on a piece of ground adjoining the Thames Embankment, and will be opened on September 28th next. Valuable prizes will be offered, and efforts are being made to obtain special features among the exhibits, such as collections of fruit-trees, showing the different methods of training, pruning, etc., also collections of fruiting trees grown in pots. It is probable also that lectures and demonstrations will be given, with the view of teaching the uninitiated something of the art of producing high-class fruit in England. London will be exceptionally rich in great horticultural exhibitions this year. Besides the usual important displays at Regent's Park, the Crystal Palace, the Temple and Chiswick, we shall have the above great collection of fruit and the International Horticultural Exhibition, which will open at Earl's Court on May 7th, and will continue throughout the summer. I have already informed you of the general plan of this exhibition, which promises to be a success, the greater portion of the vast space available for horticultural exhibits being already taken. Most of the principal London nurserymen have promised their support. Grottoes with banks of Palms and Ferns, Egyptian, Greek, Italian and other gardens, fountains, variously colored electric lights, high-class music, beside many other attractions, are being rapidly prepared. Altogether the exhibition promises to be both novel and interesting to the professional man as well as to the ordinary visitor. The *Gardeners' Chronicle* states that "the exhibition must be looked upon solely as a commercial venture, in which the District Railway and other parties are specially interested." Most exhibitions nowadays are commercial ventures, more or less. The play's the thing, after all.

London.

W. Watson.

Plant Notes.

Some Recent Portraits.

THE colored plate published in *The Garden* on the 5th of March is devoted to a portrait of *Cerithe retorta*, a member of a genus pretty generally distributed over Europe, northern Africa and Asia, and containing some showy and useful border plants. *Cerithe retorta* is probably the most beautiful member of the genus, and is a native of the Peloponnesus and of Dalmatia. It is a hardy annual, growing from one to two feet high, with much-branched stems. The lower leaves are obovate and stalked, while the upper leaves clasp the stem by two rounded auricles. The flowers, which protrude above the showy purple floral bracts, are yellow, tipped with purple. This is a plant which might be expected to flourish in the United States, where the hot dry summers should help its development.

In the issue of the same journal for March 19th there is a colored plate of *Streptocarpus Galpini*, a species recently discovered in the Transvaal, near Barberton, by Mr. E. E. Galpin, who sent seeds of it to Kew in 1890, where it flowered in October of last year. The discoverer describes it as growing in crevices in the cliffs and under rocks, and only on the tops of the mountains just below the highest summits. *Streptocarpus Galpini* is closely related to *S.*

Dunni, and, like that species, has but one leaf and a many-flowered raceme, although it differs from all other species in the form of the corolla, with a short and broad tube and a spreading almost regular limb. The color is rich blue, tinged with purple, the throat being pure white. The flowers are produced in slow succession, and continue to expand in cultivation during about five weeks. Mr. Watson, who has been so successful in hybridizing plants of this genus, was naturally anxious to cross *Streptocarpus Galpini* with other species and varieties, but his first attempt failed to produce good seeds.

In the March 19th issue of the *Gardeners' Chronicle* *Trichodesma physaloides*, a handsome boraginaceous plant of southern Africa, is figured. It is a herbaceous perennial with a fleshy root-stalk, from which are produced annually many erect stems which form clumps two feet across. The leaves are glaucous green, and the corollas, which are an inch across, are pure white. Mr. Adlam, of Pretoria, in the Transvaal, who has secured a stock of this plant, contributes to the columns of our contemporary the information that "*Trichodesma physaloides* grows near Pretoria on dry bare hill-sides at an elevation from 5,000 to 5,500 feet, and that it is an herb one to one and a half feet high with tuberous roots, the leafy stems dying down in our dry winters, appearing again with the first summer rains." The flowers are produced through the early summer, and it is a profuse bloomer. The flower-stalks and sepals are dull purple and the corollas are white. "It is suggested that the treatment given to tuberous *Begonias* would suit the wants of *Trichodesma*."

New or Little-known Plants.

Miltonopsis Bleui splendens.

THIS new Orchid is a garden hybrid raised in France by Monsieur Bleu, and it is the most distinct and beautiful among many hybrids of great promise which he has produced. It has attracted great interest, apart from its beauty, from the fact that it is the first hybrid *Miltonia* ever produced. It is the result of crossing *Miltonia vexillaria* with *M. Roezli*, plants which a few years ago were found rather difficult to cultivate, and were generally known as *Odontoglossums* of the *Miltonia*-flowered type, in which class were included *Odontoglossum Phalæopsis*, *O. Roezli*, *O. vexillarium* and *O. Warszewiczii*, all of which are now recognized as *Miltonias*.

It was only in the spring of 1872, after failures by Hollis and Roezl, that Chesterton succeeded in delivering live plants of *Miltonia vexillaria* to Messrs. Veitch & Sons, one of which, and the first one to flower in cultivation, flowered in February, 1873, in Veitch's establishment. Roezl succeeded in 1873 in delivering one solitary plant of *Miltonia Roezli* to Mr. Bull, of Chelsea, England, for a large price, and this flowered in December the same year, and created as much sensation as *M. vexillaria* had the previous spring. Thousands have, however, been imported since that time of both varieties, and have become so popular and well known that no description of them is necessary.

The plant of *Miltonopsis* raised by Monsieur Bleu was secured by Mr. Sander, of St. Albans, who called it "a marvel," and from him Mr. Ames acquired a part of the plant.

It is intermediate in character and habit between the parents, and I think will prove of good constitution. The plant now carries two flower-spikes of three flowers each well above the foliage. The flowers measure in length four and a quarter inches, and the lip three and a quarter inches across. The sepals and petals are full, as in *M. vexillaria*; the base of the petals is suffused with delicate rosy purple on white ground; the lip is large and flat, bilobed in front, and of a delicate white color, faintly veined with pink; the base of the lip light chocolate, with twelve to fifteen radiating lines about an inch in length, of a

deeper color, while the three lines on the crest are of a reddish brown. We have grown this plant at the warm end of our *Odontoglossum*-house, near the glass, and close to where we grow plants of *Miltonia vexillaria*, and it receives the same treatment as regards potting material, temperature, etc., which is given to *Miltonia vexillaria*. The plants should never be allowed to get dry, and yet care should be taken not to give them too much water while they are resting. The temperature should be kept at about sixty degrees night and day, or fifty-five degrees in extreme cold weather, with free ventilation. They should be moist continually, and the plants kept well up to the light, but not in direct sunshine.

North Easton, Mass.

W. Robinson.

Garden Market in the months of April and May are for the most part produced at Ham, where only the finest types are planted. Under the special methods of cultivation adopted these flowers attain a much greater size and finish than in ordinary gardens. Of course, there are numbers of enthusiastic private growers. Mr. Peter Barr is now searching the Pyrenees for new types, and such amateurs as the Rev. G. H. Engleheart are making interesting experiments in hybridizing. But at Ham, on the rich level ground of Mr. Walker, the Daffodil is grown purely for the market, and therefore perfection in the individual flowers is aimed at rather than the acquirement of a varied collection. Here the bulbs are now approaching full bloom. The spring is late this year in England, and thousands of flowers, representing all the leading sections, but a few varieties only in each section, are dancing in the wind.



Fig. 30.—*Miltonopsis Bleu splendens*, in the collection of Mr. F. L. Ames. The plant reduced.—See page 197.

Cultural Department.

An English Daffodil Farm.

THE Daffodil is to England what the Hyacinth is to Holland, and during recent years the golden chalice flowers have become more in request for all forms of floral decoration. We hear much of the great bulb-farms of the Low Countries, but quite as instructive and more pleasing as a picture is a Daffodil farm, where upon true market scale the principal flower of an English spring is grown as it is by Mr. Walker, whose broad acres adjoin the picturesque common of Ham, almost under Richmond Hill, in Surrey, about ten miles from London. The flowers that surprise and delight the visitor to the Covent

In 1884 the great Daffodil Conference gave an impetus to the cultivation of this flower, which amounted to a fashionable craze, but the effect of competition was to reduce the price fifty per cent., and while in 1884 it was computed that ten million bulbs were grown in England, the number is now over two hundred millions. In 1890 the flowers were sold at the rate of twelve bunches for ninepence, this reduction being due to the large and early consignments of good flowers from the Scilly Islands, Channel Islands and the south of France.

It is only when the produce is inferior that Daffodil-growing ceases to pay. Mr. Walker believes in the best cultivation, and therefore he always secures good prices. The soil is deeply dug, and before planting it is plowed, harrowed and rolled, to afford every encouragement to a vigorous healthy growth.

Naturally, the same conditions will not suit every variety alike. Some, as the so-called Whites—that is, the light-colored forms, as *Cernuus*—requiring a warmer position than those of more robust constitution, as the bicolor *Empress*. It is very interesting to note how differently Daffodils behave under the same conditions, and in 1881 Mr. Walker planted a trial bed of the various forms to test their behavior, the soil being strong loam of good depth. The result was that such varieties as *Capax* and *Cernuus* soon disappeared, but the more robust forms, like *Horsfield's* and *Empress*, thrived with surprising vigor. Manure is used only for the *Trumpet* and other robust Daffodils.

As far as possible the bulbs are lifted annually, although it seems a formidable task to go over beds two hundred to three hundred yards long. Mr. Walker places great faith in this an-

and it will be useful to indicate them as they are possessed of strong constitution and bear the finest flowers. It is necessary to weed out well for such a purpose, where the list of Daffodils includes some eight hundred forms, many of them, however, differing in a slight degree, and chiefly in color, ranging through all shades of yellow, from a pure lemon tint to almost clear white, and pure white in those *Narcissi* of which the *Pheasant's-eye* is the leading type. Among the *Trumpet* varieties the greatest faith is placed in *Empress*, although popular opinion seems to incline more toward the noble bicolor raised by John *Horsfield*, the Lancashire weaver. To an uneducated eye little difference can be seen between them, but the *Empress* increases more freely, blooms more profusely, and the flowers are of better substance than those of *Horsfield's*, which by reason of their softness do not last so long in full



Fig. 31.—*Miltonopsis Bleui splendens*, in the collection of Mr. F. L. Ames. The flowers, natural size.—See page 197.

nual lifting, and would serve all alike if it were possible, but a compromise is made by lifting the common kinds every two years and the best varieties each year. To this treatment is due the superb vigor of leaf and flower noticeable in all his plants. The bulbs are lifted when the leaves have died down, and they are dried, cleaned and replanted in the following August or September, the first variety to be planted being *Ornatus*, one of the *Poet's Narcissi*. They are planted in long beds, about five rows in a bed, and the soil is raised a few inches above the bed to keep the bulbs from stagnant water, as the growth suffers in places where the beds slope down to the ordinary level.

—Although a thoroughly representative collection of Daffodils is grown, those kinds cultivated largely are few in number,

beauty. But both are splendid varieties, the trumpet beautifully shaped, bold, rich yellow, and in striking contrast to the creamy white and robust perianth. The flowers of both attain surprising dimensions and show remarkable clearness of color, and it is not unusual to find here six and seven flowers proceeding from one bulb. When visiting Ham last year I found in a row of *Empress* one bulb carrying no fewer than eleven blooms, each of fair proportions. When we come to the true yellows a post of honor is given to *Emperor*, a superb Daffodil, splendid in form, color and size, a rich mass of yellow, and used much in the English parks, where it is planted in distinct beds to give the full richness of the handsome flowers. *Maximus* is another favorite, with flowers of the deepest yellow, splendid in shape, but, unfortunately, the

bulbs do not always display vigor in constitution. Golden Spur, one of the earliest to bloom; Countess of Annesley, Edward Leeds, Princeps, and the lovely little Tenby Daffodil, *N. obvallaris*, may also be named. Of the *Incomparabilis* section the varieties chiefly grown are *Cynosure*, *Gloria Mundi*, *Lady Watkin*, and *Sir Watkin*, the boldest of the four. Of the *Barri* group, *Maurice Vilmorin*, *Conspicuus* and *Mr. Ingram* are more largely grown than any others, while of the beautiful *Leedsii* forms those selected comprise *Gem*, *Duchess of Westminster*, a beautiful flower, chaste, sweetly scented and admirable for cutting, *Minnie Hume* and *Madge Matthews*. It is necessary to say little respecting the white trumpet Daffodils, as they seem to find little favor, although the varieties display tones of lemon and cream as subtle and pretty as in the choicest exotic. Those that have a good place are *Mrs. Thompson*, which increases more quickly than the others, *Pulcher*, *Cernuus* and *Mrs. F. W. Burbridge*. The *Burbridgei* forms are also more for the Daffodil fancier than the grower for market. The flowers are the essence of grace, and most delightful in their delicate shades, but require more than ordinary care to preserve them in true character. Of the *Poeticus* group *Ornatus* holds first place, the flowers always, by reason of their earliness and sweetness, commanding a good sale, and many would name this as the most popular *Narcissus* grown in England. *N. Poetarum* and *N. recurvus* form a succession, the list closing with the lovely *Gardenia*-flowered double *N. poeticus*, fl. pl. Mr. Walker has tried to force this variety, but without success. Other varieties grown largely consist of *Odorus*, *Odorus Nigilobus*, the double flowers like *Codlings and Cream*, and the old *Orange Phoenix*.

In the season scores of busy workers can be seen in the large packing-house getting the blooms ready for the market, bunching them together in twelves. The Daffodil seems an ideal market-flower, as it bends at right angles to the stem, thus facilitating bunching or conveyance in boxes to distant places. There are few things that travel so well, keeping fresh for even several days when carefully packed. It is important to gather the flowers before they fully expand. At Ham they are gathered when about half-open, and in the case of *Ornatus* still earlier, but they open in fresh and perfect condition.

Kew.

V. C.

Hardy Ferns.

A BED of Ferns will certainly afford the real lover of plants as much satisfaction as he can derive from an equal area devoted to any other use. The hardiest species will grow in almost any partly shaded place, but even these do much better where their needs are carefully attended to. A border along the north wall of the dwelling is usually a suitable location. The bed should be deeply dug, and the soil, even when sandy, mixed with half-decayed leaves for something more than mere porosity. Last year I witnessed an illustration of the benefits of thoroughly overturning the soil. One end of my fernery is filled with the beautiful *Ostrich Fern* (*Struthiopteris Germanica*). The group of plants, each with its vase-shaped funnel of leaves, was the especial admiration of visitors, and I never wearied of watching the plume-like fronds unfold in spring, each pinna down-curling at the tip like the veins of the feather from which the Fern takes its name. But two years ago a drain had to be laid right under these plants at no small hardship to the Fern-roots. It would have been no wonder had they all died after such rough usage, yet they made a fair show that summer; and last year, so rich and rampant was the growth that we felt we had gained a new conception of the capabilities of a much-prized plant.

In addition to the kind mentioned above, I would recommend the little *Bladder Fern* (*Cystopteris fragilis*), which makes a low growth under the *Ostrich Ferns* and is useful for bouquets; the *Christmas Fern*; the finer forms of *Aspidium spinulosum*; *Clayton's Fern*, with its hint of variegation and its odd habit of fructification, and, above all, our common *Maiden Hair*, which the author of that somewhat rare English book, *My Garden*, calls "one of the most lovely of all Ferns." There are many other useful species, though one needs to be careful or the border might be filled with plants whose fronds perish early, like those of the *Cinnamon Fern*, and leave a vacancy behind.

An edging of cobble-stones makes a suitable line of separation between a Fern-bed and grass. A similar row can be placed at the right distance from the wall to catch the pelting fall from the eaves if water-spouts are lacking, and will also prove a welcome protection to the roots of some delicate plants. Of course, the bed can be beautified by introducing a few other modest plants, whose flowers will help by contrast

to heighten the soft effect of the green fronds, and, therefore, between the Ferns and over the gray stones of the border, *Violets* can grow and any other wildling one especially likes. *Trillium grandiflorum* is very handsome through May. A recent addition to my collection, *Collinsia verna*, was charming last spring. The wild *Ginger* (*Asarum Canadense*), though brought home in the first place for further study of its curious flowers, would not be spared now on account of the decorative value of its leaves.

As my own fernery serves more as a botanical Snug Harbor, where plants can be kept under surveillance, than as a pleasure-garden, not all its inhabitants would be of general interest. Yet, even with that drawback, it is rarely without some special attraction apart from the constant beauty of the Ferns, from the first twinkling of the snowy stars of *Blood-root* to the last heads of *Eupatorium*. I have not, as yet, had success with *Cypripediums* or any *Orchid*, but the pleasures of the place depend little on doubtful ventures. Most hardy shade-loving or woodland plants will thrive, some of them in unexampled luxuriance, when removed here from the hard competition of wild life. And no part of one's demesne is likely to yield greater satisfaction than the plot wherein grow roots of one's own collecting.

Geneva, O.

S. F. Goodrich.

Shading Greenhouses.

IT will not be many days before the annual question of greenhouse-shading must be considered in all houses where summer flowers are grown. In fact, shading to some extent is required at most times when seedlings are coming on and propagation of any kind is attempted. The annual whitewash always seems to me a crude operation and a makeshift, one of the followings of precedents which is so much easier than the striking off into new paths. New paths do not always bring one safely through, but if the old one has known difficulties it is better to venture the new sometimes on chance of gain. It has become a habit to cover the glass of greenhouses as soon as the sun becomes powerful with a film of lime-wash, white-lead in benzine, or some similar coating, to remain through sunny and dull weather until shortening days allow its removal. In large ranges this is, no doubt, the quickest, cheapest and handiest way to protect the contents of a house from scorching, but it is not an ideal one. When the air is clear and the sun is shining with power the translucent glass will admit light enough to keep the plants in fair health, but most plants would be more vigorous if a certain amount of sunlight could reach them. No substitute has yet been found for sunlight which will keep man or plant in good heart. But if the plants suffer somewhat in bright weather, they deteriorate rapidly in long spells of wet, gloomy weather, especially when a little cool and evaporation is slow, for at such times rust quickly gathers and mildew often appears.

Perhaps in large establishments no improvement could be made on the present economical procedure, but it does not follow that the amateur with a small house should content himself with imitating the operations of his commercial neighbors. Aside from the imperfections noted above, applying a wash to the glass of a house is a distinctly unpleasant operation, only equaled by the temper-wearing labor of thoroughly removing the same at a later period. Cotton cloth has seemed to me worth a trial. By tacking the cloth to frames of the right size the greenhouse can be covered quickly and effectively, and it makes a good shading, though not very durable. Cotton cloth is not dear, and even at the additional expense this method seems an improvement on the wash.

Looking around for some suitable material for shading I found at a Japanese goods store some *Bamboo-screens*, made of narrow strips of *Bamboo*, woven together with thread or cord. These are very cheap, and should be fairly durable. The screens are to be had in different sizes, those of three by six feet being most useful for me. In using them I run copper wires from the ridge to the lower wall three inches from the glass, and work the screens by the simple expedient of drawing them up with a cord and allowing them to drop out of the way by gravity. A neater arrangement would be to fasten them on spring rollers, which would probably need to be well oiled at first to prevent rusting. The wires would be required with these also to keep the shade at the right distance from the glass. Now, when I wish shade in any part of the house, it is a simple matter to slip in a roll and pull it up to its place, and it is as quickly dropped out of the way. Where hanging plants are grown, it will be necessary to hang them from the girders. If the vines are properly tied out from the glass the screens will work well above them. This is not an

ideal arrangement, but it is an improvement on the former one for my purposes. Its advantages are that it is cleanly and handy. It is quickly applied, and as quickly removed. In dull weather it is out of the way, and the plants have the benefit of all available light. When it is up, and the sun is shining ever so strongly, some of its rays filter through to keep the moisture in motion, which is an important point, and to keep the plants in good heart. The screens being three inches from the glass there is this air-space filled with hotter air rising to the ventilators and helping to keep the lower air cooler. At least it seems to me that on a hot day, with the sun shining, it is distinctly cooler under these cool-looking shades than it was when the wash was used. This may be partly imagination, but as I am not sure that my plants do not possess some of that useful faculty, perhaps they may be affected by the same influence. With the flickering sunlight over them, my plants can scarcely fail to keep in good condition, especially as the shades are dropped at night and the early morning sun is allowed to flood the house.

Elizabeth, N. J.

J. N. Gerard.

Tomatoes from Immature Seed.

IN the Eighth Annual Report of the Wisconsin Experiment Station Professor Goff reports a series of tests which have been conducted for several years to show to what extent plants may be modified by the selection of seeds. In the fall of 1883 seed was taken from mature fruits of Cook's Favorite Tomato and from other fruits of the same variety which had nearly attained their full size, but had not commenced to change their color. The next year plants were grown from both these selections of seeds, and in the autumn seed was taken as before from ripe fruits of the plants grown from ripe fruits, and from immature fruits of those grown from immature fruits. This was continued for four years, and again in 1889 the experiment was repeated with seed which had been saved from fruit grown in 1886, so that there has been secured one strain of Tomato grown through six generations of seeds known to be fully mature and another strain of the same number of generations from immature seed, and the two strains have been grown side by side.

The effect of this selection upon the plants is made very clear by illustrations in the bulletin, which show that the plants from immature seed have been perceptibly reduced in size, while their prolificacy has been increased. Ten plants grown from ripe seed last year, after the fruit had been picked, weighed more than twice as much as the same number of plants from immature seed. Ten plants from ripe seed up to the middle of September had matured 1,298 fruits, while the plants from unripe seed had matured 2,519 fruits which weighed nearly twice as much. Besides these differences the use of immature seeds has plainly tended to promote early maturity, and in a comparison carried on for five years the strain from unripe seed gave fruit on an average twelve and a half days earlier than the other strain. The size of the fruit from immature seed has been reduced about one-twelfth. This fruit is less firm than that from ripe seed; the rind is thinner; it has a somewhat greater tendency to ripen unevenly, and it is often slightly green at the centre when appearing ripe externally. In keeping quality it is inferior to that from ripe seed, as a rule. In form it is more oblate, contains more cells, and has a greater tendency to grow double. The posture of the plant has been rendered more decumbent, while the color of the foliage has been uniformly lighter, and its tendency to blight has been noticeably greater.

In summing up, Professor Goff thinks that the following practical lessons may be deduced from these and some other experiments with feeble plants:

"1. The results suggest that in our climate the Tomato, at least its more rampant-growing varieties, may be rendered more productive and earlier in maturing by a treatment that reduces the native vigor of the plant. Growing the plants on rather poor and dry soil, pinching the growing points, or root-pruning should accomplish this end.

"2. The health of plants is in a degree dependent upon the quality of the seed used. In these days of severe competition in the seed trade, dealers are doubtless often tempted to use immature or otherwise unsuitable stock for seed. The popular demand for cheap seeds tends to deteriorate quality in this commodity, and consequently in our crops, and to render the latter more subject to disease.

"It must not be understood that the use of immature Tomato-seed is sanctioned or recommended in this article. The experiment is not as yet complete, and it is too early to announce its full teachings."

Early Spring Flowers.

AT the last meeting of the Pennsylvania Horticultural Society Mr. John Bell read a paper on the "Garden in Spring," from which we extract the following paragraphs relating to the earliest flowers:

If the ground is not covered with snow in February one of the most striking features one would see in taking a walk through our grounds would be beautiful carpet-like masses of the yellow Buttercup-like flowers of the Winter Aconite (*Eranthis hyemalis*) and groups of the different varieties of the Snowdrop. These grow in the shade of a large-leaved Magnolia-tree (*M. macrophylla*) on a slope facing east, where the grass will not grow in summer. A few steps farther, on the margin of a group of the Great Laurel (*Rhododendron Maximum*), we come on a group of Christmas Roses (*Helleborus*) in varieties from pure white to dark purple, some with green flowers and some with greenish white flowers. Beyond these are Crocuses in many colors, with their flowers opened while the sun shines on them, and in the near distance can be seen the male blossoms of the Filbert or Hazel-nut, and the catkins of the Goat Willow, which are very beautiful at this early season.

The various evergreens, both trees and shrubs, are very cheering at this time, some of the oldest trees having their trunks covered with varieties of the evergreen English Ivy. Among the broad-leaved kinds near the house are groups of hybrid Rhododendrons and Azaleas, *Euonymus Japonica* and its varieties, *Daphne Mezereum*, *D. Laureola*, *D. Pontica*, *Kalmia latifolia*, *Leucothœ Catesbæi*, *Heather (Erica carnea)*, *Ilex glabra* and *I. verticillata*, with its red berries hanging on all winter, and all helping to lighten up the dreary season in February and March.

At the close of March and in the early days of April appear on the margins of these groups of shrubs the various species of Primula—*P. Japonica*, *P. Sieboldi*, *P. vulgaris* (English Primroses), *P. veris* (Cowslip), *P. elatior* and other hybrids, Spring Snowflake (*Leucojum vernalis*) and Summer Snowflake (*L. æstivum*), Wood Anemone and *Anemone Pennsylvanica*, Moss Pink (*Phlox subulata*) and its varieties, with the Spreading Phlox (*P. divaricata*), and the various kinds of Scillas.

Then we have in sheltered places a beautiful variety of evergreen herbaceous plants starting into new growth, after lasting all the winter green and fresh. Among these are *Arum Italicum*, the Madonna Lily (*Lilium candidum*), *Pachysandra procumbens*, the Christmas Fern (*Aspidium acrostichoides*), four species of Yucca (*Y. filamentosa*, *Y. Gloriosa*, *Y. glaucescens*, *Y. angustifolia*), Butcher's-broom (*Ruscus aculeatus*), *Hypericum calycinum* and Evergreen Candytuft (*Iberis corraefolia*). A very large tree of the white Yulan Magnolia (*M. conspicua*) stands surrounded with a thick growth of the Children's Bluebell or Grape Hyacinth of English meadows (*Muscari racemosum*), intermixed with the Tenby Daffodil (*N. obtusiflorus*), one of the first of the family to bloom, while on the shady side of the tree a group of the wild English Cowslip (*P. veris*) is in bloom at the same time. Then follow in succession the many species and varieties of the Narcissus family, the good old Daffadowndilly, Butter and Eggs, Pheasant's-eye and the rest, coming into flower one after another until May, and with the last of these are associated the white and purple flowered Wood Lilies (*Trillium grandiflorum* and *T. erectum*), the Wild Tulip of the English woods (*T. sylvestris*), the blue alpine Anemone (*A. alpina*), the double and single flowered Pile-wort (*Ficaria ranunculoides*), our beautiful native Dicentras, the Blood-root and the various sorts of Dog-toothed Violets. Of course, this does not include all the interesting hardy flowers among the earliest ones, for there are Fritillarias and Violets, the Siberian Columbine and Twin-leaf, and many more, but surely here is a list which ought to be able to brighten any rock-garden or border from the time that snow falls until the trees are in leaf and before the gay season of Peonies and Roses.

The Forest.

Timber-culture in Eastern Nebraska.

A VISIT to a region where land has been secured under the timber-culture acts will convince any one that the sciences of those "proving up" claims were often quite elastic, and the forlorn appearance of many of the trees and bits of woods proves that the legislation failed to effect the beneficent end it proposed. But some of the claims give evidence of hopeful possibilities in timber-culture. Last winter I was at the farm of Mr. James Stephen, a business man of Central

City, Nebraska, 130 miles west of Omaha, or very near the ninety-eighth meridian and not too near the arid region for trees to do fairly well. The farm is on the south side of the Platte, which here comes near the bluffs, and lies on the margin of the plain, which rises considerably higher than the river-valley. The plain is carved along its edge into irregular masses of knolls, which form the bluffs. These are separated by numerous little valleys called "draws," which come down from the plain to the river-valley below, and through them the water flows from the edge of the plain above when it falls in sufficient quantity. There is scarcely any trace of a stream-bed, for there are no pebbles or stones to mark it, and the little hollows are soon overspread with grass and other plants. The draws are an evidence of a climate dry at some seasons, but with rain enough at times to run down the slopes and wash out the earth.

It was on the slope of one of the draws that the principal plantation stood, near where it started from the plain, so that it had essentially the same prairie-like soil. This is a dark clay or marly loam, mixed with some sand. The quantity of sand in the soil of the bluffs increases, and the soil becomes less productive as the river-valley is approached. The aspect of this tract of trees was eastward, with a slight bearing to the north. Smaller areas had been planted on the tops of the ridges nearly on a level with the plains and more exposed to the wind, for it was evident that the slope protected the trees to a certain extent, since they were smaller on the west side, where most exposed to the prevailing winds. When the claim was approved by the Government there were 6,800 trees on five acres of ground. This amount is far from excessive when compared with what may be borne on an acre, but they stood quite close together and would soon need thinning, though a natural process of thinning would soon begin. The species chiefly planted were Black Walnut, Elm, Box Elder, Ash, Catalpa, Red or Silver Maple, Sycamore and Honey Locust—the first three kinds predominating. The Cottonwood was discarded as undesirable, though a few had obtained a foothold. The owner took the most pride in the larger tract of three and a half acres, where the trees had been planted six years and most of them were from two to four inches in diameter and from eight to fifteen feet high. The majority of the vigorous trees on the larger area would average three inches in diameter and ten to twelve feet high. As yet all species had grown to about the same height, although there was a difference in the character of the tops, which varied somewhat in accordance with the natural habits of the trees. The bark showed a healthy growth, being close, even and free from fungi, insects or anything injurious. The few Cottonwoods accidentally present served for comparison, having made a larger growth in the same time, the boles being from six to eight inches in diameter and the trees from twenty to twenty-five feet high.

The Black Walnuts were of special interest on account of their greater economic importance than most of the other kinds. Most of them were fine straight specimens, and in sufficient quantities in many parts of the grove to occupy the ground exclusively when they needed the space for development. How high they may grow or what dimension of trunk they will attain can only be determined by the future, but at six years of age they were very promising. As the Black Walnut is indigenous to eastern Nebraska, this is also in its favor. It is found north of Central City in the vicinity of the Elkhorn River and north-west near the boundary of South Dakota, on the bluffs of the Niobrara and its tributaries. Professor Bessey has found it as far west as the one-hundredth meridian. In central Kansas, Indian Territory and in Texas it reaches ninety-eight and a half degrees west. Trees on the Niobrara were two to three feet in diameter, and lumber had been manufactured from them. The altitude of Central City is about 1,800 feet; that of the region about the Niobrara (Long Pine Creek) 2,250 feet. Fruit was observed clinging to the branches of the Box Elder (a common tree also along the streams where any timber was seen), Sycamore, Ash, Honey Locust, Catalpa, and I was told that some of the Black Walnuts had borne.

These groves had been carefully attended, and the weeds kept down till the trees were large enough to care for themselves or did not allow the ready passage of a horse and cultivator between the rows. The main implement used besides the hoe was a triangular harrow, like the old-time corn-cultivator, with drag-teeth extending two or three inches below the beams, not far enough to interfere with the roots of the young trees. The tops now form a canopy sufficiently dense to shade the ground and prevent the growth of grass and injurious weeds, and the leaves are already lodging about their roots and beginning to form a mold, so that forest-conditions of soil have

already begun, and such wood-plants will only grow as flourish in the shade. The trees had also been judiciously pruned. Owing to climatic conditions there would probably be greater need of this in Nebraska than in the forest-region farther east, for in the western edge of the forest-belt, and where it stretches out along the rivers, there is observed a special tendency of the trees to branch low down. One of the first characteristics noticed by a person familiar with the appearance of forests along the Mississippi and eastward, and passing through this region for the first time, is the low habit and widely spreading tops of the trees seen along the streams. Many of them are nearly as broad as high, with very short trunks and bushy crowns. The general facies is that of trees growing in an orchard. Several trunks may at times be seen starting from the surface of the ground, or but little above it, as if the trees were huge overgrown shrubs, or had developed from stool-shoots springing up from the base of a tree of earlier growth which had passed away. This was always very pleasing to the eye, for nearly every tree with such a habit was ornamental, but it would not be as useful for timber. From this tendency of the climate trees that are planted would doubtless share in this habit, and extra pruning, or very close planting, would be necessary to counteract it. An orchard of Plum and Cherry trees on the farm showed the same habit in an impressive way. From trunks barely more than a foot high limbs freely branched, giving all the trees the appearance of dwarfs, much like an orchard of dwarf Pear-trees. They had compact, well-rounded tops and were very shapely, and even handsome.

There was another view of timber-culture suggested by these groves, the bluffs and draws along the Platte. Much of the land is poor, especially near their margin, with soil too thin for profitable cultivation and becoming dry in summer. Then the land is rough with countless little valleys and knobs, often with steep sides like those bordering a ravine. It would seem advantageous for the greater part of such a region to be given up to forest-culture. If furnished with trees they would in time supply a large amount of useful timber to a contiguous region greatly in need of it. The valley is broad, from three to ten and twenty miles, and essentially flat, but with a downward slope sufficient to give the river a strong current. The river itself is usually a mile or more in width, but very shallow. The water in many parts of it almost, or quite, disappears in the summer season, making its way as a subterranean stream in the loose earth, which is reached by digging a few feet beneath the surface of the ground. Though it has doubtless shifted its bed more or less from side to side in the valley in the past and cut away the bluffs and widened its flats, it is evident that the valley owes much of its width to the slow disintegration of the plain bordered by the bluffs, the water from the edge of the plain passing down through the draws and cutting them slowly back, for the elevations bordering the draws, or scattered through them in their wider parts, are of all shapes and sizes, from little knolls but a few feet high to small hills with tops on a level with the plain, and everywhere shows the erosive action of water. A forest covering land circumstanced like these bluffs would prevent additional wear and transportation of the richer soil from the edge of the plain into the valley below.

The trees growing here corroborate what a study of the best rain-charts indicates, which is, that fully half of Nebraska, aside from the region of sand-hills where they come into its eastern part, is so situated with regard to precipitation as to make the growth of timber practicable, while belts along the streams extend the region still farther west. Then it is to be borne in mind that the dry season, or time of least precipitation, is the winter, the period of rest for trees, so that they receive their supply of moisture in the growing season when most in need of it.

Englewood, Chicago, Ill.

E. J. Hill.

Correspondence.

Transplanting the Trailing Arbutus.

To the Editor of GARDEN AND FOREST:

Sir,—Admirers of the Trailing Arbutus, or May-flower (*Epigæa repens*), may be glad to know that this charming plant can be successfully transplanted to one's home grounds with reasonable certainty of success. At least such is my experience after having transplanted several, which at this writing (April 20th) are in full bloom for the second time since they were placed beneath the Laurels, Huckleberry-bushes and scrub Pines skirting my lawn. The first plants set out were taken up February 2d, 1891, having been brought from an open hill-side about a quarter of a mile distant. On the following

day three unusually large, long-stemmed plants were received by express from a locality over twenty miles distant, the earth being mostly loosened from the roots by the shaking the box had received during transit. The last-mentioned plants had a precarious existence for a time, and considerable portions of each died; but the surviving portions became in due time floriferous and made new growth. The others did not for a moment seem affected by the change, but grew vigorously and bloomed most profusely. The last of October a friend brought me a plant which he had taken up carefully and placed in a basket; this grew uninterruptedly after planting, and is now in bloom. In December one of the plants set out in February had to be again transplanted, on account of the removal of the tree which shaded it. It apparently received no injury from this second transplanting, and is now as full of blossoms as the other plants, although it was one of those whose survival after the first transplanting I for some time despaired of.

The dates of transplanting were various, and in no instance according to rules "laid down in the books." The secret of my success consists, I think, in three things I was careful to observe, as follows: (1) Remove the plant without disturbing the roots, though experiment No. 2 shows that plants which have their roots nearly denuded may be saved by careful replanting. (2) Select a place for replanting which has conditions of soil, exposure, etc., as nearly as possible like those where the plant originally grew. (3) Plant carefully.

The best way is to cut all round a plant with a spade, not less than two inches beyond the extremities of the longest stems; the entire piece should then be carefully lifted by running the spade horizontally underneath, at least three (better four) inches below the surface of the ground; the whole should then be placed in a basket on damp moss, and replanted at once. In replanting remove a piece of surface-soil a little larger and deeper than the piece to be planted, the difference in depth to be made up by the addition of sand, or sand and fine gravel; then carefully insert the piece, firming it down well, especially about the edges, and fill in whatever space there may be around it with sandy or gravelly soil firmly impacted.

While the plants set out soon after being taken up grew most vigorously, it is among these that the most unpromising specimens are now found. The present bad condition of these I attribute to the disturbance of their roots by pulling out grass which had begun to crowd and choke them. The plants which had been nearly dried by shaking off the soil from their roots during transportation were planted on a dry hill-side, under low-branched scrub Pines, and consequently have not had the grass to contend with, which, doubtless, accounts for their continued improvement since convalescing.

Brookland, D. C.

Robert Ridgway.

Easter Flowers in Philadelphia.

To the Editor of GARDEN AND FOREST:

Sir,—The season just past showed an increased demand for flowering plants in the celebration of this festival, and though a greatly increased supply was provided the local market was not overstocked. The Lilies continue to hold first place among Easter flowers, and generally they were of very good quality, the stocks being about equally divided between *L. Harrisii* and *L. longiflorum*, though there is some reaction of opinion in favor of the latter for Easter use, while *L. Harrisii* will probably retain its precedence as an early-forcing variety. Some of the commercial growers produced fine specimen Lilies by planting four or five bulbs in an eight or ten inch pot, and many of those grown in this manner produced from thirty to forty flowers, and for certain purposes such groups are admirable. Plants of this character are too costly, however, for general retail purposes, and a majority of flower buyers prefer a single-stemmed Lily when well-grown and crowned with five to ten large flowers. *Lilium candidum* is but little grown now for Easter use, though a charming plant for cut-flower arrangements. Some few other species have been tried to a greater or less extent in the past few years, among them *L. auratum* and some varieties of *L. lancifolium*, but though they are beautiful in themselves, yet they do not attract much attention from the buyers of Easter flowers, and consequently these ventures have not proved profitable.

Cytisus and Hydrangeas were also plentiful and met with a ready sale, small and medium-sized Hydrangeas apparently being most in demand, and since the season was late there was no difficulty in getting these plants in flower at the proper time without resorting to hard forcing. Azaleas continue to hold their place among the indispensables for Easter decoration, and they were not overplentiful this season, at least those

of good quality. Comparatively little change in varieties was seen among the Azaleas, most of them being such standard sorts as Madame Vander Cruyssen, Eugene Mazel, the white Bernard Andreas, Borsig and a few others, the most notable among the newer varieties being *Vervæniana* and a bright crimson named Flambeau. The latter has a very striking color, and will doubtless soon become better known.

Bulbous stuff, in general, was not of remarkably good quality, though some fine Tulips and Von Sion Daffodils could be seen, the Daffodils being very popular for corsage-bouquets at this time. In cut flowers the quality was good, Roses in particular having been favored by the cool days immediately preceding Easter; this made them more firm in texture, and consequently more lasting. Among Orchids the flowers of Cattleyas, *Cypripedium Lawrenceanum*, *Dendrobium densiflorum* and a few other *Dendrobiums* were chiefly used. Some cut blooms of *Anemone Japonica* could be seen, and, though pretty, they attracted but little attention.

As usual, a great many Palms were used, few decorations seeming complete without more or less of these most graceful of foliage plants. Araucarias, too, were used to some extent, and though very durable for house-decoration they are somewhat expensive, from the fact that so far they have nearly all been imported from Europe. This is likely to be remedied in a few years by the propagation of sufficient stock on this side of the water, for European importations are frequently disappointing from the number of imperfect plants they contain.

Holmesburg, Pa.

W. H. Taplin.

Spraying Machines and Insecticides.

To the Editor of GARDEN AND FOREST:

Sir,—Will you name some portable spraying apparatus suitable for the needs of a small place—a garden with fruit-trees—and their approximate cost?

2. Is there any way to circumvent the aphid on the Snowball, which attacks the under side of the leaf so that it curls up?

Whitewater, Wis.

Albert Salisbury.

[So many manufacturers make good pumps for spraying with insecticides that it is hard to say which is the best. For work like that mentioned by Mr. Salisbury a Knapsack sprayer would be satisfactory. One called the Eureka is made by N. Bokel & Co., of Philadelphia, which has a good apparatus for spraying the under side of leaves; this costs \$21.00. The Galloway sprayer, which is about one-third cheaper, is made by Albinson & Frusheim, of Washington. The Excelsior sprayer, which costs about as much, is made by Stahl, of Quincy, Illinois. The Field Force Pump Company, of Lockport, New York, have a sprayer of a different pattern and at nearly the same price, and a still cheaper one is named the Ideal, and is made at Egg Harbor, New Jersey. If Mr. Salisbury would apply to the experiment station in his state, no doubt Professor Goff would tell him which machine he finds most effective there, and our readers generally will receive intelligent answers to questions relating to insecticides and fungicides by applying to the horticulturists at the experiment stations of their various states.—Ed.]

The India-rubber Tree.

To the Editor of GARDEN AND FOREST:

Sir,—The bushy habit of specimens of *Ficus elastica*, mentioned in a late issue of GARDEN AND FOREST, may be secured by forcing, with the best conditions of soil, temperature, etc., but many amateur growers do not have these conditions. To check the upward growth of a large plant which was making rapid headway in our garden two years ago, a band was tightly wrapped below the topmost leaf. The growth in this direction was checked, and several branches soon started out along the main stem. When these were well grown the band was removed, so as to allow asymmetrical development. This method is better than that of cutting off the main stem.

Brooklyn, N. Y.

M.

Insects on Cherry-trees.

To the Editor of GARDEN AND FOREST:

Sir,—I have several Cherry-trees which seem to be fairly vigorous, but each year they are covered with black insects

which destroy the fruit and render the foliage unsightly. Can you suggest an efficient remedy?

Brooklyn, N. Y.

T. G.

[These insects are the ordinary and often-destructive Cherry-lice (*Myzus Cerasi*). They appear early in the season without attracting much attention, but they multiply very rapidly if the weather is warm and dry. The remedy for them is to spray the tree with the kerosene emulsion diluted fifteen times, or with whale-oil soap-suds, in the proportion of one pound of soap to eight gallons of water. Two ounces of crude carbolic acid added to the mixture will make it more effective.—Ed.]

Notes.

From a Carnation-house one hundred and twenty-five feet long and twenty feet wide near Philadelphia, chiefly planted with the variety Lizzie McGowan, there were cut during the season up to the 1st of April more than 70,000 flowers.

The reports from different cities in the country, which were published in the *American Florist* last week, show that the trade in flowers for Easter was larger than it has been for years. The stock of Lilies was unusually large, but not a flower seems to have been wasted.

Among the shrubs of comparatively recent introduction is a Japanese member of the Witch Hazel family called *Corylopsis pauciflora*. It has short drooping racemes of yellow flowers, which appear before the leaves, and it is really an admirable garden-plant, which ought to be better known.

A peculiarly fine effect in mahogany (says a writer in *The Sun*) is obtained by sawing crotches. A piece is sawed just above and just below a point where two limbs shoot out on opposite sides. When such a piece is properly cut up into veneer, the crotches show in beautiful plume-like markings through the middle of each sheet.

A recent writer, describing the winter aspect of the geyser-basins in the Yellowstone Park, says that one of the most interesting features of the hot pools is the continued growth of vegetation throughout the year. In certain spots underground heat preserves an even temperature in the earth, no matter how cold the atmosphere may be; and, in consequence, rich patches of green may be found entirely surrounded by masses of ice and snow.

Mr. George Klehm has for some years been growing Tulip-bulbs at his place on the shores of Lake Michigan, near Chicago, and every year he is successfully and profitably enlarging his business. In a paper read before the Florists' Club of that city it was argued that Mr. Klehm's experience had demonstrated that the business of raising Tulips, and perhaps some other kinds of Dutch bulbs, could be made a profitable industry even in the climate of Chicago.

In reply to several correspondents who wish to write to their representatives in Congress concerning the attack on Yellowstone Park we would say that the vicious scheme to grant exclusive privileges to the Montana Mineral Railway Company is House bill Number 4545. It has already been reported favorably in the house. Senator Warren's bill, which reduces by one-half the forest-reservation adjoining the park, has also been reported back from the committee to the Senate. Its number is 2373.

A correspondent of the *Gardeners' Chronicle* complains that throughout the Forest of Dean and elsewhere where there are large woods, swarms of men, whom he calls "Fern-tramps," are constantly gathering Ferns, which they carry away in large sacks for sale. In many places rare varieties of Ferns are almost exterminated. To this the editor adds that he has seen bushels of Ferns exposed for sale on costermongers' barrows in the streets at eightpence per dozen, at which rate there soon will be very few left in the country.

Winter Sweet is the appropriate English name given to *Toxicophlæa spectabilis*, one of the interesting woody plants which have been more or less crowded aside to make room for the more popular Orchids. A portrait of this plant is given in the last number of the *Gardeners' Magazine*, which has come to hand, and well shows the flowers crowded into axillary corymbs and wreathing the long branches with white blossoms. The fragrance of these flowers is very sweet and penetrating, and the plant does not need the stove treatment

which is usually given to it, for it thrives perfectly in a temperate house, although it does not flower so early. Plants of this kind will not suffer neglect, and they too often are little less than eye-sores, but if they are carefully cultivated, specimens in full health are beautiful objects, and will remain so, from year to year, for a long time.

The public reservations of all kinds in the city of Washington, including the parks proper and the small spaces which are called squares, circles and triangles, but excluding the Botanical Garden and the grounds of the Department of Agriculture and the Soldiers' Home, amount to about 400 acres. Two hundred and sixty-eight acres are estimated to be in a condition which needs no further improvement, eighty-three acres to be partly improved, and forty-six as yet wholly neglected. The Botanical Garden covers ten acres and the Agricultural Grounds cover forty acres.

The Parapee Palm (*Guilielma speciosa*) is cultivated by the Indian aborigines of the Guianas for its fruit, which they largely use as food. They plant it about their settlements, and where it is found apparently wild in the forest, examinations will show that such situations were formerly occupied by the Indians. In some seasons the fruit is produced without seed—that is, it consists entirely of pulp, like the plantain and banana, while in other seasons it contains seeds; this variation occurs in the fruit of the same trees from season to season, and plants raised from these seeds show the same characteristics of variation in the fruit. When boiled or roasted the fruit has something of the texture and taste of a very dry mealy potato. It is palatable, very nutritious, and residents in the interior have a particular liking for it. When ripe the exterior covering of the fruit is yellow, thin, and only slightly fibrous, while it is mealy and yellow within. The fruits, which are individually about the size of a pigeon's-egg, are borne in bunches of from forty to sixty together. There are two or three bearing seasons in a year.

We have spoken on more than one occasion of a disease which attacks the Sugar Beet, and which has been identified with the scab fungus of the Potato discovered by Dr. Thaxter; and now, according to a bulletin just issued by the Indiana Experiment Station, a new disease of this Beet has been discovered in the form of a bacterial parasite which does not cause the death of the plant nor show any spots on the surface nor any discoloration of the tissues. A puffed condition of the mature leaves, and their smaller and paler development, are its best external signs, and it is shown in the root when cut open by the greater prominence of the fibre, a yellowish tint and a less firm texture. The microscope shows the presence of numbers of bacteria in all the tissues, although the gross characters already given do not enable one always to separate healthy and diseased Beets. It is not known yet how the disease is transmitted from plant to plant, and no method of averting it is suggested. Its insidious character is plain from the fact that it has so far escaped detection or even suspicion, although examination showed that it was common throughout Indiana, at least. The disease is certainly a matter of serious importance to all who cultivate or use the beet crop because it decreases the sugar contents of the beets materially. In some cases studied at the station the loss amounted to as much as fifty per cent.

The horticulturists and fruit-growers of the United States have demonstrated their alertness to grasp new ideas in the speedy adoption of the practice of spraying to protect their orchards and vineyards against insects and fungi. The practice on the other side of the Atlantic in this direction is much less advanced than it is here. Almost all of our experiment stations have issued instructive little manuals on the subject, which any one can have for the asking, and these manuals answer almost all the questions which any intelligent fruit-grower will ask. Bulletin 86, which has been just issued by the Experiment Station of New Jersey, contains in twenty pages almost all the information needed by those persons who intend to use insecticides and fungicides during the coming season. It does not pretend to give any new information, but in a concise way it gives all the necessary directions as to the selection of machinery, the preparation of insecticides and fungicides, the method and time of application, etc. There is no need of repeating any of this advice here, since it has all been given more than once in these columns, but it is worth while to remember that a spraying-machine of some kind has become a necessary part of the machinery on every farm, and no gardener, fruit-grower or farmer should rest satisfied until he has prepared himself with the proper apparatus and has learned how to use it intelligently.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLES:—Formal Gardening.....	205
The Love of Nature.—II.....	205
Notes of a Summer Journey in Europe.—XIV.....	J. G. Jack. 206
Internal Decay of Forest-trees.....	T. H. Hoskins, M.D. 207
Coontie and Conte.....	E. J. Hill. 208
FOREIGN CORRESPONDENCE:—London Letter.....	W. Watson. 208
PLANT NOTES:—The Narcissus. (With figures.).....	J. N. Gerard. 209
CULTURAL DEPARTMENT:—A Selection of Strawberries.....	E. P. Powell. 210
Flower-garden Notes.....	E. O. Orpet. 211
Flowers in Bloom.....	J. N. Gerard. 212
Campanula pyramidalis, Alstroemeria pelegrina, var. alba, Medinilla magnifica, Primula rosea.....	T. D. Hatfield. 213
THE FOREST:—The Forests of California.....	Wm. Alvord. 213
CORRESPONDENCE:—German Forests as I Remember Them.....	Wilhelmine Seliger. 214
Hardy Plants at Short Hills.....	G. 215
Sabal Palmetto.....	Abbot Kinney. 215
Araucaria excelsa.....	J. W. K. 215
NOTES.....	215
ILLUSTRATIONS:—Narcissus cyclamineus, Fig. 32.....	209
Narcissus maximus, Fig. 33; Narcissus minimus, Fig. 34.....	210
Narcissus cernuus pulcher, Fig. 35; Narcissus monophyllus, Fig. 36.....	211
Narcissus incomparabilis, Fig. 37; Narcissus triandrus, Fig. 38.....	212
Narcissus rupicola, Fig. 39.....	213

Formal Gardening.

THE little book entitled *The Formal Garden in England*, which was reviewed a few weeks ago in this journal, is very interesting in its descriptions of some old English places, and it is not seriously injured because in the warmth of their enthusiasm the young authors are moved to commend some samples of alleged garden-art which would be ridiculous if they were not dignified and almost hallowed by historical associations. It is plain that the authors have no clear idea of what the masters of that art mean when they speak of the "natural style of gardening," and yet the book appears to exist not so much to commend the formal gardens of Old England as to condemn another kind of gardening, to which the authors refer under the name of landscape-gardening. We call attention to this, however, not to take sides in any controversy, but simply to repeat what has often been said in this journal, that there is no reason why one kind of gardening only should be used; indeed, there is every reason why different styles should be employed for different purposes in different places. More than this, the fact that one has an intelligent appreciation of true landscape-art does not argue any inability to enjoy the best examples of formal gardening. Indeed, it is probable that one with the catholic sympathies and free imagination which enable him to take pleasure in beautiful gardens of every kind has a more genuine and consistent delight in formal gardens than the professed champions of this style exclusively.

The first essential of a formal garden is, of course, its formality, or perhaps we should say its mathematical symmetry both in surface and outline. In connection with this we are accustomed to see conspicuous brightness of color, but the very best examples of formal garden art may exist without brilliant colors, and, indeed, formal flower-beds where carpet patterns are reproduced in emphatic colors are so often used in places where rigidity of outline and vividness of color are conspicuously out of place that they

have done very much to prejudice persons against the very name of formal gardening. It has been said that the garden is an essential part of the dwelling, and that therefore it must have the same kind of balance, regularity and finish, or, in other words, that the immediate surroundings of the house must have architectural treatment, and the methods which have governed the design of the house should be carried out to the surrounding grounds. It is not true that this is the only way to make a consistent house-scene that is to bring the house into perfect harmony with the grounds, but it is one way, and a very good one in many cases, to produce a homogeneous result. In more spacious areas, like public parks, there are places where, in connection with terraces, promenades and similar constructions, the planning and the planting can have this same formal and architectural character with the very best effect.

It must be remembered, however, that quite as much skill of one kind is demanded to make this formal treatment effective as there is of another kind of taste and training to produce a good landscape-picture. It is true that many efforts to create or improve scenery in this country and in Europe are dismal failures; it is equally true that examples of the best formal planting are even more rare than those of the most effective natural planting. When it is decided that formal treatment is the best for any particular place we are at once brought to face the real problem in the situation. Creative faculty is needed here as truly as it is in any of the other arts of design, and where shall we look for the artist who has been trained for such work? Very plainly the men who are skilled at laying ribbon-lines and constructing portraits of eminent citizens out of Echeverias are not to be trusted. Ornamentation of this latter kind is too crude to be classed as art. And yet the student will find little that is better than puerilities of this sort. We stand in need of both precept and example, and it is to be hoped that the next work on formal gardens will attempt to lay down some of the canons which should control their design and construction.

For success in the best architectural gardening no man can have a sense of color too refined or too clear an idea of the beauty of form and proportion, and yet it should be remembered that, at its best, garden-art of this kind appeals to the sense of beauty alone, and while it may give the keenest pleasure we should remember that there is a higher art which addresses itself to the nobler part of man's nature. A natural landscape or a genuine work of landscape-art possesses something more than beauty, something beyond perfection of form and color. Its essential charm is in the inner meaning to which it gives expression so as to move the feelings and touch the heart.

The Love of Nature.—II.

ONE frequently hears persons who are planning for their summer in the country declare that this year they want to "go somewhere else and see something new," not because they have any special fault to find with their former place of residence, but because they are tired of the especial phase of natural beauty which it offers them. The mountains one year and the sea the next, or at least a change from one mountain or sea-side place to another, is the rule of summer life with many people. They would be surprised to be told that it is the rule because they care little for nature. If they really loved nature in the full sense of the term, they could exercise their admiration within very narrow limits, and find in the same scenes perpetual stimulants to æsthetic curiosity. And they would be likely to content themselves within such limits because a special love for individual local beauties would result from long acquaintance with them.

In Mrs. Robbins' *Rescue of an Old Place* she rightly says that one great benefit which springs from the possession of

a few acres of ground is the development of a love for home, the suppression of that restless desire for change which makes so many Americans "possible tramps" instead of established citizens. But a genuine love of nature will serve a person pretty well in place of the actual ownership of a portion of the earth's surface. For in whatever corner of the country he may chance to be he will see, understand and love every part and phase of its beauty, and thus, in a sense, feel himself the owner of the whole region; and the oftener he visits it the stronger and more intimate will become his feeling of attachment to it. Of course, he will not be without a natural desire to see as much of the earth as possible, and to learn how many kinds of beauty it can show. But this desire will not be the imperative need for "a change" which is felt by less fortunately endowed persons, and often it will be so much weaker than his desire to stay among the things which he knows best, and therefore loves best, that year after year will pass, and foreign lands, or even neighboring regions, will tempt in vain while he watches new clouds blow over his familiar hills, the flowers spring up in his familiar woods, and every long-familiar shrub and tree assume a new aspect with each season's growth and changes.

This is the true secret of every kind of love; if a thing appeals to us at all, the better we know it the more we care for it. The true lover of nature loves it as the true lover of humanity loves men. He has his favorite corners of the world as he has his friends, and does not constantly wish to change them for others, or perpetually contrast their attractions with the attractions of others. If every one admires them his joy in them is increased; but if he is almost alone in appreciating their charm, this fact is in itself the source of a special kind of pleasure and pride. He seeks for novelty and freshness in the things which surround him as he likes his friends not to be all day and every day the same. He travels to new scenes in the same way that he likes to make acquaintance with interesting strangers, but comes back as gladly to the familiar spot as to the familiar face. The tree which he has watched as it grew from a sapling to a fine specimen delights him more than an even finer specimen about which no memories or anticipations cluster; and even if he has not planted and watered it himself, even if it grows in the neighboring forest instead of his own field, he has for it, nevertheless, a genuine personal affection. If he drives through a beautiful new country his eyes are perpetually charmed; but when he drives through the roads around his home his heart is touched and his imagination stirred by the beauty of past years as well as the beauty of to-day, and by the feeling that everything he sees is linked in some way with his personal experience. Each tree is a friend, each shrub has a special voice for his special ear, each flower is greeted as the child of other flowers which he knew last summer in the same corner of the road-side. In short, he not only admires what he sees; he is interested by everything he sees in a sense that is impossible where things are beheld for the first time. And true love, if it means admiration, means interest also, whether inanimate things or human beings are in question.

One who is truly interested in nature, therefore, does not need fine views in the usual acceptance of the term—great ranges of mountains, picturesque stretches of rocky coast, or outlooks over wide panoramas of hill and valley and river. Every view not seriously marred by some incongruous work of man has some charm for his eye. And he recognizes, moreover, that a very fine view must often be purchased at the expense of other attractions. If, for instance, there are mountains around him, he cannot have that far, low horizon-line which, stretching its mighty curve at a seemingly immeasurable distance, gives an unequaled sense of space, freedom and infinity. "I have never seen the sky before," a painter once exclaimed who had passed his life in hilly regions, and now, for the first time, stood in the low, quiet Cape Cod country; "I did

not know it was so big or so near or so arching, or that there were so many stars, or that a sight of them all could be so magnificent. I never before saw the moon come up from below the earth instead of merely from behind the hills, and I never saw the whole of a sunset until I came here." And he seemed to think that the panorama of the morning and evening and midnight skies was as admirable as any terrestrial panorama which could be unrolled before him.

Again, in our crude and often maltreated land, grandeur in the distance often means raggedness and forlornness in the foregrounds, and a sensitive eye thinks the foreground of a picture as important as its background. Where forests have ruthlessly been cut away, and where there is not a rich soil to encourage neat and careful cultivation, primeval beauty has largely vanished and the beauty of civilization has not replaced it. The true lover of nature will feel this painfully, and all the magnificence of the mountains beyond may not compensate him for the lack of that harmony and repose in general effect which come when all parts of a picture are in keeping. We do not say that the true lover of nature cares nothing for grand scenery, only that he does not actually need it. Great things impress him, but small ones enchant him, and he gathers pleasure from the road-side grass as well as from the giant Oak or the sky-line of a rugged mountain range. There is a beauty of the Lily and a beauty of the Pine, a beauty of the mountain and a beauty of the plain, a beauty of wide outlooks and a beauty of enclosed and sequestered corners. One kind of necessity excludes another kind; but that does not matter to him, for all arrest his eye, interest his mind, and make appeal to his imagination and his heart.

Notes of a Summer Journey in Europe.—XIV.

PROBABLY no city in the world can equal Paris in the beauty of its little parks and promenades, and more particularly for the wealth of flowers which is displayed throughout the summer in the flower-beds in these public places. But the exhibition of gayly colored exotics is sometimes introduced where a bit of pure nature would be a pleasant change. While such a fine show may seem appropriate enough in the Tuileries gardens, its effect is not altogether pleasing in such a place as the beautiful little Parc Monceau, where the formal flower-beds of glaring colors seem out of place among naturally grouped trees and shrubs.

But in spite of these inharmonious features the Parc Monceau seemed to me a charming model of a little city park. The situation is most favorable, and the trees and shrubs have for the most part been grouped with such good judgment and with such pleasant effect that, unlike most town parks of a few acres, one thinks of this as a country place, and not a garden in the heart of a city.

On the other hand, the famous Jardin des Plantes is likely to prove somewhat of a disappointment to most visitors. It may be that too much is expected, but the fame of the illustrious names which have been connected with this institution for nearly three centuries and the high order of scientific work which has been accomplished very naturally kindles the expectation of finding a botanic garden of the very highest order in every respect. Unlike some other botanical gardens, the Jardin des Plantes does not claim to be a popular institution, but prides itself on its scientific value. Therefore, in the purely scientific and systematic collections of living plants, no attempt is made to produce anything ornate. The greenhouses are not often freely open to the public, and there are some interesting collections not easy of access without special permits. If we find the garden inferior in some respects to what might be expected of it, from its age and fame and as the representative botanical institution of a great nation, it should be remembered that its situation and soil are not of the best, it has never been properly endowed by the Government, and, from all accounts, it suffered severely from the shells of the besiegers in the last great war.

The collection of living plants is undoubtedly one of the largest and most valuable in the world, but in many cases the specimens are not in a very thrifty condition. This, however, does not apply to the public floricultural display, which apparently receives much attention. Within the principal enclo-

tures, known as the "School of Botany," almost everything is planted in narrow parallel rows, which arrangement, although not so agreeable to the eye as a less formal and more scattered grouping, has the advantage of permitting perfect botanical sequence, so that one need not constantly refer to a plan in order to find particular groups of plants. In no large collection in a limited space can a classification in strict botanical sequence be perfectly satisfactory, because the trees will crowd and take from the soil what the neighboring smaller plants should have, and it is hardly possible to give each group the most congenial conditions of soil and exposure. The system of labeling is very complete here, the labels being of iron, neatly made, and the inscriptions in good distinct type. Indeed, there are more and better labels in proportion to the plants than in any scientific collection I ever saw. But, although the labels are so numerous and in such good condition, their inscriptions are not always to be relied upon as giving the correct name of the plant, and there is serious inaccuracy in the determination of species, certainly among some species from North America. To cite examples from our common eastern American Oaks: *Quercus alba*, *Q. macrocarpa* and *Q. nigra* are all represented as our Swamp White Oak, *Quercus bicolor*; a Red Oak has the Scarlet Oak label before it; *Quercus alba*, *Q. prinus*, *Q. prinoides*, *Q. coccinea* and other common American Oaks are not represented. *Betula nigra* is labeled *Betula lutea*, and the Canoe Birch (*B. papyrifera*) is passing as our Sweet or Cherry Birch (*B. leuta*). A long list might be made of instances like these, which shows that if the specimens are to have their intended educational value closer attention should be given to their names. Such mistakes are, no doubt, often caused by the stupidity of workmen, but when an establishment of such renown allows errors like these to pass unnoticed it is hard to blame nurserymen or commercial dealers for disseminating plants under wrong names. They might easily, and with some justification, give as an excuse that the plants were so named in the School of Botany of the Jardin des Plantes at Paris. A use of synonyms is perhaps more excusable, and we find this and other European gardens giving us credit for more species of such plants as Poplars, Ashes, Buckeyes, etc., than our botanists claim.

The garden contains many great rarities, and those persons who wish to see the most precious specimens and the very latest arrivals should seek admission to the very private little "pépinière," or nursery, which is crowded with interesting plants.

The visitor comes across old trees or trees of historic interest in various parts of the grounds of the establishment. The oldest tree of Paulownia in Europe is here, having been introduced in 1834, and now having a trunk six feet in circumference. The species has been planted in some of the squares, where it is kept cut back to a low broad shape, affording a dense shade, and apparently bearing pruning and the city atmosphere remarkably well. In a corner near the museum buildings is the aged specimen of our common Locust (*Robinia Pseudacacia*), which, the affixed label tells us, was introduced into France by Jean Robin in 1601, and that this tree was planted where it now stands by Vespasian Robin in 1636 (see GARDEN AND FOREST, vol. iii., p. 311). The trunk is now so much decayed that the tree can hardly live much longer. It has been patched up with plaster or cement, and the limbs are held together by iron rods. The Cedar of Lebanon planted by Bernhard de Jussieu in 1735 is apparently in as good health now as it could have been at that time, and it has a trunk about four feet in diameter. It is planted on a dry bank, just such a situation as should be selected for it in cold regions, so that its growth is not too rank. It seems surprising that attempts to grow and naturalize this tree in America are not more frequently made. Another plant of much interest is a specimen, now thirty years old and partly decayed, of the *Prunus Davidiana*, introduced from China by the celebrated traveler and collector after whom it was named. This plant has never fruited, a characteristic which has so far been followed by its grafted progeny at the Arnold Arboretum, where it is the very earliest of the Rose family to blossom, flowering this season as early as April 8th. The flowers seem perfect enough as regards stamens and pistils, and the non-fruiting peculiarity has been attributed to frost or cool weather at the time of blossoming, or, what may be quite as probable, to the lack of pollen from flowers of different seedling plants of its own kind. It is a question worth testing carefully. A little-known shrub or small tree of the Witch Hazel family is *Parrotia Persica*. A specimen of this here has several thick stems from the same base, is twenty feet high, and has a spread of thirty feet in diameter. It has proved quite hardy

in the vicinity of Boston, but as its flowers are not remarkable for any peculiar beauty, and it is chiefly valuable for the colors of its autumnal foliage, it is perhaps no more desirable from an ornamental point of view than some of our native Cornels and Viburnums. The flowers appear as reddish clusters of stamens in spring before the leaves.

The garden has been the medium through which many of the recently introduced Asiatic plants have been distributed, and it annually issues a long list of seeds of plants it has for exchange. While in some respects there are features about the garden which prove a disappointment, the herbarium and museum connected with it contain mines of wealth for the student in botany, and every one acquainted with the labors of Franchet and other students connected with it to-day recognizes the value of the scientific work still carried on within these unpretentious walls.

Arnold Arboretum.

J. G. Jack.

Internal Decay of Forest-trees.

MY observations upon this subject, given in a recent issue of GARDEN AND FOREST, have brought me a large number of letters from many states, showing that the evil is a widespread one and difficult to account for. My own limited experience led me to infer that it might be due in some degree, if not wholly, to the situation of my woodland in a deep and narrow valley. I am not quite convinced that this is not the fact; but it seems evident from what I have gathered that this central decay of the trunks of forest-trees is not limited to such situations. Quite fortunately, in looking up another subject a few days since, I came upon the following, under the head of "Larch," in the Allen edition of the *Encyclopædia Britannica*. Here it is stated that the woolly aphid, or "Larch-blight," often attacks the trees in close valleys, but rarely spreads much unless other unhealthy conditions are present. But "a far more formidable enemy is the disease known as the 'heart-rot'; it occurs in all the more advanced stages of growth, occasionally attacking young Larches only ten years old or less, but is more common at a later period, when the trees have acquired a considerable size, sometimes spreading in a short time through a whole plantation. The trees for a considerable period show little sign of unhealthiness, but eventually the lower part of the stem near the root begins to swell somewhat, and the whole tree gradually goes off as the disease advances. When cut down the trunk is found to be decayed at the centre, the rot usually commencing at the ground and gradually extending upward. Trees of good size are thus rendered nearly worthless, often showing little sign of unhealthiness until felled." The writer of this article in the *Encyclopædia* adds that the manner in which this disease spreads indicates a fungal origin, and that some fungus mycelium may be the remote cause of the disease; but that "there is little doubt that any circumstance that tends to weaken the tree acts as a predisposing cause of the attack," and he thinks the best safeguards are probably perfect drainage and sufficient thinning. The writer of this article of the *Encyclopædia* is C. Pierpoint Johnson, editor of *Sowerby's Wild Flowers*.

But the most interesting letter which has come to me in this connection is from a well-known gentleman in New Hampshire, connected with the agricultural press. From this letter I make the following extracts: "I have often noticed in the woods in Maine, and in other places where I have had opportunity, this tendency to decay at the heart, although I never heard it discussed. It would seem possible that the location between wet and dry soils was the cause of the trouble. We know that the strip of land at the foot of a long slope, just before we come to a muck-swamp or a stream, is the hardest to convert into tillage land. A few inches of loose black scurf on a hard pan of white or rusty sand, when cleared it produces moss and running Blackberry-vines until Firs and Hackmetacks again come to the rescue. On my farm we cleared up a large meadow along a brook, and another in a dense swamp where the drainage was very slow, and the trees were so tall that we had to cut back some distance to get the shade off the grass land. On this border the trees were rotten at the heart. The White Maples and Black Ash and Elms and the other trees which were at home and sound on dry land, seemed to be affected on this strip. One Elm, about fifteen inches in diameter, had a shell about two inches thick; I sawed it off in sections and nailed on board-bottoms for feed-boxes. An Ash, with a shell about one inch thick, I split and made into troughs for feeding sheep. A Yellow Birch, with about three inches of shell, I made into a farm-roller." This writer thinks the interior rottenness in all these trees was probably due to the death of the tap-roots, from the unfavorable

nature of the soil, and the extension of the decay upward through the trunks of the trees.

Referring to the perfect soundness of the *Arbor-vitæ* trees of north-eastern Maine, previously alluded to by me, an item caught my eye in a recent copy of a Houlton (Maine) newspaper, as follows: "One of Aroostook's giant Cedars was cut by Geo. Humphrey's men at Thomas Taylor & Son's camp, on Cary Brook, last week. This Cedar was four feet on the stump, sixty-two feet long and ten inches in diameter at the top end—making 1,491 feet of inch-lumber."

Newport, Vt.

T. H. Hoskins.

Coontie and Conte.

THE article in GARDEN AND FOREST, of February 3d, 1892, on *Smilax Pseudo-China*, recalls an interesting bit of history connected with the botany of the south, which also brings forcibly to mind the difficulties in identifying a plant known only by a common name. I refer to the Coontie of the Florida Indians, the aboriginal name of *Zamia integrifolia*, the plant from which Florida Arrowroot is obtained. At first *S. Pseudo-China*, or some other species of *Smilax*, was supposed to be the Coontie, or Coontia, of the Indians. Dr. William Baldwin, one of the early investigators of the botany of Georgia and Florida, held this opinion. From 1812 to 1817 he was in this region collecting plants, and he seems to have been the first to identify Coontia with *Zamia*. Dr. Henry Muehlenberg, his constant correspondent, shared these doubts about the Coontia, or Bread-plant, of the Seminoles. This correspondence was published by Dr. William Darlington, in *Reliquiæ Baldwinianæ*, and in a letter dated June 18th, 1812, Muehlenberg asks Dr. Baldwin, "What is the real Coontie of the Indians? Is it *Smilax laurifolia*, or do you find it figured in Catesby or elsewhere?" Baldwin replies: "The root which furnishes the Coontia of the Creeks is certainly *Smilax*."

Five years later, after Dr. Muehlenberg's death, he found the real Coontia south of St. Augustine, and in 1817 he writes to Darlington: "Here, in a thin sandy hammock of small Live Oaks, Cabbage and San Palmettoes, I had the gratification to find the 'Wild Sago,' or Coontia, of the Seminoles, and to assign it its place in the sexual system—*Dioicia*, *Polyandria*, natural order *Palmæ*. I have no books with me to refer to, but it is probably a new genus, approaching very closely in habit to the real Sago family (*Cycas*). At supper I had the pleasure to eat the bread prepared from the large tuberous root of this plant. . . . I have no hesitation in saying that it will be found among the most important of our Esculentia." A few days later he writes: "I now find that my Coontia, or Wild Sago, is nothing more nor less than *Zamia pumila*—that is, *Z. integrifolia*, Willd. Dr. Baldwin therefore traced the Coontia of the Seminoles, whatever may have been that of the Creeks, to *Z. integrifolia*."

Referring to Bartram's Travels (English edition, page 160), and the only place where much is said of it, there is no allusion to its use as food, but to its beauty alone. As Bartram was particular in his observations, this seems strange, and may indicate that he was unacquainted with such a use of *Zamia*. Subsequently he went to an Indian village, perhaps not far from Appalachee Bay, and in middle Florida. Here he was entertained by the Indians, and partook of a dish which he calls conte (contee in the table of contents), and of which he writes (*ibid.*, 239) quite minutely: "Early in the morning our chief invited me with him to take a final leave of the White King. We were graciously received and treated with the utmost civility and hospitality; there was a noble entertainment and repast provided against our arrival, consisting of bear's ribs, venison, varieties of fish, roasted turkeys, hot corn-cakes, and a very agreeable cooling sort of jelly, which they call conte; this is prepared from the root of the China-brier (*Smilax pseudo-China*; *S. aspera*, fructu nigro, radice nodosa, magna, lævi, farinaacea; Sloan, *Nat. Hist. Am.*, i., p. 231, t. 143, f. 1; habitat Jamaica, Virginia, Carolina and Florida). They chop the roots in pieces, which are afterward well pounded in a wooden mortar, then being mixed with clean water in a tray or trough, they strain it through baskets; the sediment, which settles to the bottom of the second vessel, is afterward dried in the open air, and is then a very fine reddish flour or meal; a small quantity of this mixed with warm water and sweetened with honey, when cool becomes a beautiful, delicious jelly, very nourishing and wholesome. They also mix it with fine corn-flour, which being fried in fresh bear's-oil makes very good hot cakes or fritters."

A question of interest is suggested by this quotation, whether this agreeable food, conte, of these Indians (called Lower Creeks as well as Seminoles by Bartram) is the same as the

coontia of the Creeks and Seminoles mentioned in the letters of Muehlenberg and Baldwin. There is a similarity in the names, which may be a matter of etymology—of words coming from the same root and indicating a food-product of analogous use. But this does not necessarily make them identical. Though not, perhaps, too far north for the growth of *Zamia* (if the conte was derived from a local plant), since Bartram on the third day of his return from this village to the St. John's speaks of gathering seeds of *Zamia*, it would hardly seem that one mentioning *Smilax* so definitely as the source of conte would confound it with another plant. Then he must have been well acquainted with *S. Pseudo-China*, which he mentions elsewhere, and which was a common plant from New Jersey to the Gulf of Mexico, a region through which he passed more than once.

Is there, then, in the large tuberous roots of this *Smilax* a food worthy of the attention of those in quest of new native sources of food-supply? How valuable might it be if used as an esculent, and improved by cultivation like most of the vegetables which come to our tables. Animals are well aware of its edible properties, for pigs root up the ground for the tubers, a fact also noticed by Pursh in his *Flora*. Its useful qualities were also known to other botanists. Elliott, in his *Sketch of the Botany of South Carolina and Georgia*, does not mention it as an esculent, but says of it: "This species forms the basis of many 'diet drinks' among the 'unlicensed faculty.' From the roots, with Indian corn, sassafras and molasses, the negroes manufacture a very pleasant beer." Rafinesque is more explicit. In his *Medical Flora* he says of *Smilax*: "All more or less equivalent. *S. Sarsaparilla*, best known; *S. Pseudo-China*, largest roots, extend one hundred feet in damp soils, forming clusters. Much used by the southern Indians for food, mush, and the fecula is a red-brown flour. Good beer made with sassafras and molasses purifies the blood. Shoots eaten like asparagus. *S. caduca*, *laurifolia*, *tamnoides*, etc., equally used." Having mentioned their medical properties, he concludes: "Properties reside in the bark containing pariline, fecula, mucus, albumen. The centre is pure fecula, inert, esculent."

Englewood, Chicago, Ill.

E. J. Hill.

Foreign Correspondence.

London Letter.

THE meetings of the Royal Horticultural Society in April and May are invariably of more than ordinary interest. The last one was remarkable for the numerous examples of well-flowered specimens and rare Orchids, Anthuriums, Hippeastrums and other stove-plants, hard-wooded greenhouse-plants and hardy flowers. The Orchids included a group of the noble *Dendrobium Phalænopsis*, var. *Schroederianum*, from Messrs. Sander & Co., showing even greater variety in color than we have hitherto seen, besides extraordinary size and vigor of growth. Already one can see that this *Dendrobium* promises to be one of the very best of tropical Orchids. From the same firm came plants in flower of the new *Cypripedium Chamberlainianum*, which was unanimously awarded a first-class certificate by the Orchid committee. It is rich in color, peculiar in form, and, while scarcely deserving to be placed among the very best of the *Cypripediums*, it can hardly fail to rank high as a garden plant if it only proves amenable to ordinary cultivation. *Masdevallias* included the pretty hybrid *M. Courtauldiana*, which is now flowering at Kew, and the rare little *M. Wendlandiana*, interesting as being the only known tropical species of *Masdevallia*. At Kew it grows and flowers freely in the East India-house. Messrs. Hugh Low & Co. contributed a group of choice Orchids, chiefly *Cattleyas*, *Odontoglossums* and *Vandas*. They also sent the delightful little *Angræcum fastuosum*, the large *A. sesquipedale*, beautiful though somewhat out of season, and the dainty little *Saccolabium bellinum*, which is a specialty at the Clapton Nurseries. Messrs. B. S. Williams & Son sent numerous *Vandas*, *Dendrobium Wardianum* and the large-flowered variety of *Cochlioda vulcanica*, recently introduced and named *grandiflora*.

The importance of these periodical exhibitions held by the Royal Horticultural Society in London is testified to by the frequent contributions which come from Continental

gardeners. Messrs. Linden sent to this meeting from Brussels some beautiful *Odontoglossums*, including *O. Pescatorei*, var. *Lindenizæ*, which has large purple-spotted flowers, and another variety, also purple spotted, named *maculatum*. *Odontoglossums* are cultivated better in Brussels than I have seen them anywhere, and the nurserymen there are fully alive to this. I believe Mr. Linden never misses an opportunity to acquire plants of the choicest and most valued varieties with a view to their multiplication. Messrs. Veitch & Sons sent *Dendrobium atrovioleaceum* and several hybrids, including one raised from *D. Pierardii* and *D. superbum*, which they call *D. Adrasta*. It has soft pink sepals and petals and a pale yellow lip.

The amateur exhibitors were led by Sir Trevor Lawrence, who sent *Cypripedium Elliotianum* with eight flowers, a beautiful example of good cultivation, and a hybrid called *C. lawrebelleum* (a ridiculous name, pure Choctaw to outsiders!), which is the result of crossing *C. Lawrencianum* and *C. bellatulum*. The flowers are in form like those of the first-named parent, their color being rosy crimson with brown-purple lines, the dorsal sepal margined with white, and the petals spotted with chocolate.

From Mr. H. J. Elwes came a grand specimen of *Vanda Denisoniana*, with a cluster of healthy growths bearing no fewer than eight spikes of large milk-white flowers. *Dendrobium primulinum* was shown in exceptionally fine form. Several beautiful varieties of *Miltonia Roezlii*; the distinct Siam variety of *Cypripedium insigne*; *Cattleya Marriottiana*, a hybrid between *C. Skinneri* and *Lælia flava*; the magnificent *Odontoglossum Leeanum*. These and many other rarities were conspicuous among the various groups which crowded the exhibition hall.

Cliveas were well shown by Messrs. B. S. Williams & Son, and also by Messrs. J. Laing & Sons, both firms making a specialty of these plants. *Hippeastrums* were represented by *Crimson King* (Veitch) and *Firebrand* (G. Paul & Son), both awarded certificates. There were also large groups of these plants from other nurserymen.

Magnolia conspicua, the Yulan *Magnolia*, was shown by Mr. Hudson, gardener to Messrs. Rothschild at Gunnersbury House, Acton, where there is a specimen of this noble *Magnolia* thirty feet high and as much through, and which at this season of the year is always a magnificent picture of snow-white flowers. *M. stellata* (Halleana) was shown in flower, the type, a rose-tinted variety and a double-flowered form. At Kew this little species is grown in a round bed on a lawn, where it forms a pretty mass eighteen inches high. It is quite hardy here. It also does well when grown in pots and slightly forced for the conservatory. *Rhododendron campylocarpum*, a hardy species from the Himalayas, with large trusses of large yellow flowers, was shown by the Exeter Veitchs. I may note here *R. fulgens*, also Himalayan, which is now in full flower outside at Kew among the hardy *Rhododendrons*. The plant is probably forty years old, and it is now crowded with heads of the richest rose-crimson flowers.

Roses, some of them new; *Ericas* of various kinds, the most conspicuous being *E. ventricosa coccinea* and *E. Cavendishiana*, *Epiphyllum Makoyanum* and *E. Gärtneri*, both varieties of one species, which was recently figured in the *Botanical Magazine* under the latter name. A *Cineraria* named *Snowflake Improved*, with the flowers wholly white, came from Messrs. J. Carter & Co. It will be a useful plant if its character can be fixed so as to come true from seeds.

Daffodils. There was a special exhibition of these plants, with a special committee to award prizes and discuss the merits of new kinds. The programme for the day also included a lecture on *Narcissi* by the Rev. G. P. Haydon. It is scarcely possible for any one nowadays to say much that is new about Daffodils, to English growers at any rate. The lecturer traveled along the beaten track, and gave good advice to amateurs and beginners, for whom his remarks were specially intended. He suggested that flower-collectors should be compelled to carry a license

similar to a game license as a preventive to the destruction of wild flowers, which at present were being totally eradicated from some localities by the vandal flower and plant collector, who often dug up by the bushel rare plants which could not possibly survive the treatment they got.

London.

W. Watson.

Plant Notes.

The Narcissus.

NOW that the *Narcissus* season is here, it may be interesting to note the distinguishing characters of the groups into which this family is divided, and give in a compact form the main points of their structures as a guide to a more careful study of these ever-welcome flowers. The popular name of Daffodil, which is generally used in the garden, is only correct as applied to two forms of *Narcissi*—i. e., the *Narcissus Pseudo-Narcissus*, the flat-leaved or Trumpet Daffodils, and *N. Bulbocodium* (*Corbularia*), Hoop Petticoat or Rush-leaved Daffodils. In other words, Daffodils are *Narcissi*, though only the large-crowned *Narcissi* are Daffodils. A *Narcissus*-flower is structur-

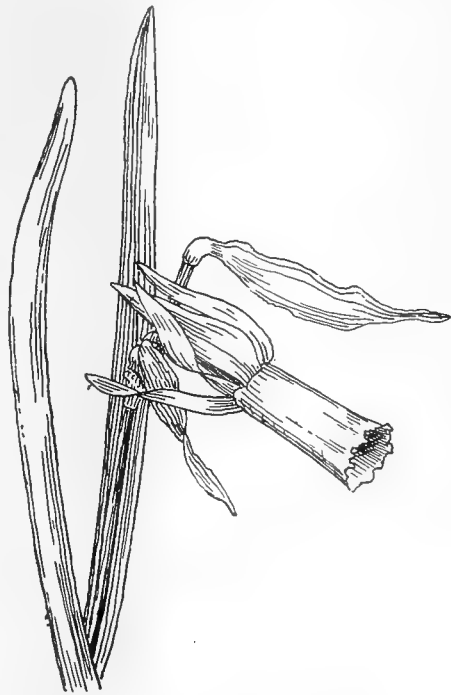


Fig. 32.—*Narcissus cyclamineus*.

ally composed of an ovary, the perianth-segments (popularly the saucer), and the tube, otherwise called the crown, the trumpet, the trunk or corona. An inferior ovary is situated at the base of a cylindrical tube. From varying localities along this tube spring the perianth-segments, and beyond these the cup is prolonged. In the Daffodils the six stamens are of equal length, and have the same point of insertion low down near the obconical-tube. In the true *Narcissi* the tube is much longer, narrower and cylindrical; the six stamens are divided into two sets of three each, which are inserted, one set near the mouth, and the other three midway between the crown and ovary.

The varieties of *Narcissi* are endless and beyond the ken of man, and authorities are not yet agreed as to the number of distinct species. Mr. J. G. Baker, of Kew, published in 1869 a clear and concise system of grouping, which has been generally adopted by growers and by the trade. Mr. Baker's groups are based on the length of the perianth-segments as contrasted with that of the cup. The three groups of Baker are:

GROUP I. *Magnicoronati*, the large cup.

GROUP II. *Mediocoronati*, the medium cup.

GROUP III. *Parvicoronati*, the small cup.

Each of these groups is divided into sub-genera, species and sub-species; but for the non-botanical reader and cultivator it will be simpler and sufficiently clear to divide the groups according to the plan of Mr. F. W. Burbridge, of Dublin, into two sections—A, the flat-leaved kinds; and B, the rush-leaved kinds. Under this arrangement we give the different sections with an illustration of a typical flower of each:

GROUP I. Large cup, crown as long or longer than perianth.

Section A. Flat-leaved. Type, the wild Daffodil of England, and including *N. Pseudo-Narcissus*; the Ajax varieties of Ha-



Fig. 33.—*Narcissus maximus*.—See page 209.

worth, and innumerable forms and sizes from *N. minimus* to *N. maximus*. All have flat glaucous leaves. The better-known garden forms of this section are—Yellows: Ard Righ, Countess of Annesley, Cyclamineus (fig. 32), Emperor, Golden Spur, Henry Irving, Maximus (fig. 33), Minimus (fig. 34), Obvallaris (Tenby), Rugilobus. Two-colored varieties: Empress, Grandis, Horsfieldii, Princeps, Scoticus, Bicolor præcox. White and sulphur varieties: Cernuus (fig. 35), Colleen Bawn, F. W. Burbridge, Minnie Warren, Moschatus, Pallidus præcox. Double: Telamonius plenus (Von Sion), Capax plenus.

Section B. Rush-leaved. Type, *N. Bulbocodium* (Corbularia), the Hoop Petticoat Daffodil of southern Europe. Of these there are six varieties, all with the expanded crinoline-like corona (fig. 36).

GROUP II. Crown half or rarely three-quarters as long as the perianth divisions; the Chalice-shaped crown of Parkinson.

Section A. Type, *N. incomparabilis* varieties (fig. 37). The varieties of this group are supposed to be hybrids, except Odorus, Juncifolius and Triandrus. Garden forms of these comprise: Self-yellow varieties. Yellow varieties with orange cups; Gloria Mundi, etc. Sulphur-colored varieties; Sir Watkin, etc. Peerless varieties; Cynosure (primrose perianth, orange cup), Princess Mary (white perianth, orange cup). White varieties; Mary Anderson, etc. Leedsii varieties, with Eucharis-flowered chalice, cup white; Leedsii, Amabilis, Duchess of Brabant. Humes' hybrid straight-crowned Daffodils. Backhouse's hybrids with coffee-cup-shaped crown. Nelson's hybrids with goblet-shaped cup; Nelsoni major, Aurantius, Pulchellus. Double varieties; Aurantius plenus (Butter and Eggs), Albus plenisaurantius (Orange Phœnix), plenus sulphureus (Codlins and Cream or Sulphur Phœnix).

Section B. Types, *N. Odorus* (Campernelle Jonquil), *N. triandrus* (fig. 38), *N. juncifolius* (the smallest Rush-leaved Daffodil).

GROUP III. The small-crowned Daffodils or true Narcissi.

Section A. Types, *N. poeticus*, *N. Tazetta*. In this section are comprised the well-known *N. poeticus*, also the various bunch-flowered Daffodils, as Paper Whites, Grand Monarque, Soliel d'Or, Staten General, etc.

Section B. Types, *N. gracilis*, *N. rupicola* (fig. 39), *N. Jonquilla*; the Jonquils are the best-known form of this section.

A review of the genus *Narcissus* to 1887 is embodied in Baker's *Handbook of the Amaryllideæ*, 1888; Burbridge's *History and Culture of the Narcissus*, published in 1875; *Ye Narcissus or Daffodil*, by F. W. Burbridge and P. Barr; and Hartland's *Album of Daffodils*, will all prove useful to those interested in the study of this genus.

In this climate the flowering of Narcissi is influenced by so many sudden changes of temperature that it would be impossible to give any definite or even general idea as to the succession of flowers to be expected with any certainty. As to the varieties the Ajax section comprises the largest number of favorites, a good selection being for garden purposes Emperor, Empress, Horsfieldii, Grandis, Obvallaris, Golden Spur, Maximus, Countess of Annesley, Ard Righ, Rugilobus, Cernuus, Pallidus præcox and Telamonius plenus. A fine selection from the other sections, omitting Polyanthus, is Sir Watkin, Barrii conspicuus, Duchess of Westminster, C. J. Backhouse, Princess Mary, Poeticus ornatus, Gloria Mundi, Cynosure, Nelsoni, Poetarum, Poeticus plenus, Orange Phœnix, Capax plenus.

Elizabeth, N. J.

J. N. Gerard.

Cultural Department.

A Selection of Strawberries.

THE list may now be fairly divided into early, medium and late. Crystal City till recently was our best very early. Michel's Early did not prove to be what was hoped for and promised; the berry lacks quality, and the plant productiveness. Beder Wood is, on the contrary, a really good berry, very productive and of good size. Mr. Crawford thinks it the best very early berry that he has yet grown. Leader has secured three prizes from the Massachusetts Horticultural Society. It is a very early sort, and, I believe, is destined to secure the very foremost place. Lovett's Early is another new candidate of great promise. It is said to be larger than Wilson, and more prolific than Crescent. The color is bright crimson and the shape perfect, while the flavor is high. It gave ripe berries last year on the 22d of May in New Jersey, which is something remarkable. It is almost as early as Crystal City, and we may, therefore, expect to discard that inferior fruit very soon. What we have wanted was a good market and table fruit as early as Crystal City. We can confidently plant Leader and Lovett's Early and Beder Wood.

Of medium berries Cumberland comes so close after the early as to deserve a mention at the head. It is an old sort that very few are willing yet to discard. Mrs. Cleveland is, on the whole, one of the best berries I ever raised. It is large, but not largest; good flavor, not the best; brilliant in color, and enormously prolific. It begins early and bears long. Among forty new varieties I hold Mrs. Cleveland one of the very best. Crawford has very large and excellent berries, but it has not proved regular in size or as prolific as Mrs. Cleve-



Fig. 34.—*Narcissus minimus*.—See page 209.

land. Haverland is splendid when the season is not too wet, but it is sometimes watery and soft. The berry is of the largest size, and of good, but not the best quality and color. Gillespie, a seedling of Haverland, bids fair to outstrip it. One of the

most wonderful berries in my trial-beds has been Thompson's 51; it is not yet introduced. It is big enough for a pear. Lida I reckon among the best, and it should not be discarded for new favorites. Bubach is among the leading sorts, but it

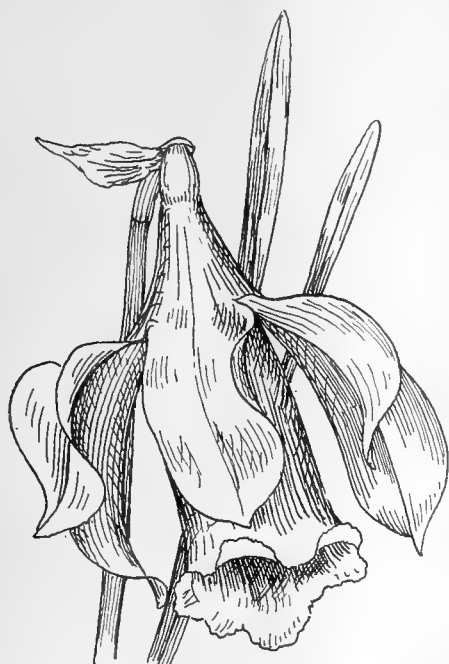


Fig. 35.—*Narcissus cernuus pulcher*.—See page 209.

has a pistillate flower. Edgar Queen is a monstrous berry of excellent quality. The fruit of Saunders is finely shaped, very large, and of a fine glossy red. The flesh is also red, and the flavor fine. Pearl I have always liked. The plant is a capital grower in a large stool, while the berry is both handsome and excellent. Enhance is probably ahead of all in cropping, but not in quality. It is an enormous berry, not always well shaped. Parker Earle is remarkable for the favor it has received in widely separated regions north and south. The berry is of fine size, not largest; long and necked, firm and handsome, and an extraordinary cropper. It is almost late enough to be classed in that list rather than as medium-early. Warfield and Crescent I reject, as I do Wilson, because they are too sour for a good home berry. As shippers they are, of course, good; but there are just as good shippers that are much larger and sweeter, and I am quite of Mr. Terry's opinion, that it does not pay to grow berries that do not average large. The time lost in picking is great, and in market the biggest are always in demand; the others are often not wanted, and must sell at low figures.

Of the late sorts Manchester is old, but still good, only a little too tart. Yale is winning its way as a really first-class berry, and extra for canning. It is solid and dark red, and colors finely in the can. The quality is of the best. Gandy has some strong friends, but many report it as not sufficiently prolific, which is about the truth of the matter. A new berry is being pushed as something remarkable, and remarkably late—the E. P. Roe. It certainly is very late, the last fruit having reached market about the middle of July. It resembles the old Kentucky, and will bear testing before much planting.

I have not mentioned in the list of main croppers Bubach with sufficient emphasis, because I do not yet see one berry that should crowd this out; and as for Sharpless, which should be ranked almost with the late, it is with me invaluable for quality, and good for quantity. Others do not find it to have either of these qualities. My soil is clay, and moist. It seems very probable that Beverly will prove one of the principal rivals of the Bubach and Sharpless. It has received a large number of prizes and has a perfect flower, while Bubach is pistillate.

It is impossible to make out a list of Strawberries for the whole country and for all soils. Cumberland and Bubach have come as near as any to being universal berries. I grow my berries on an eastern slope, a warm soil for clay, and keep it well fed. I plant in hills, and let them run into matted rows after the first year's good crop. The best time to plant is invariably very early in the spring.

Clinton, N. Y.

E. P. Powell.

Flower-garden Notes.

THESE are busy times in the hardy flower-garden; all protective coverings have been removed, and plants are coming up vigorously. No time should be lost in moving plants now, as the less growth they make before they are planted the more certain the success the coming season. Some plants never do so well as when planted while small where they are to remain, and I am convinced that this is one of the secrets of success with that beautiful Columbine, *Aquilegia glandulosa*. Many people prefer large plants, and it must be admitted that, in some cases, they are desirable, but many of the more robust sorts, such as *Delphiniums*, *Campanulas*, *Aquilegias* and *Phlox*, grow with greater vigor if they are transplanted when small. The first flower in the garden this season was *Primula denticulata nivalis*, the white form of a well-known Himalayan Primrose. The spikes of flowers come before the foliage, as in *P. rosea*, and are pure white, with a yellow eye. These were raised from seed a year ago and planted in a shady corner in a group with *P. rosea*, which is now also in bloom. The typical *P. denticulata* is also perfectly hardy, and the flowers are lilac-colored. *P. cortusoides* is also in flower, and is a pretty little species, often said to be the same as *P. Sieboldii*, but there is a vast difference from a garden standpoint, the last-named plant being much better, the numerous varieties making a charming group in themselves. We are so accustomed to seeing *P. Sieboldii* grown indoors in pots that we are apt to forget how well it thrives outside in a shady moist situation if slightly covered in winter, as the roots are rhizomatous and easily lifted by frost. Those who possess a rock-garden would do well to try these Primulas, selecting for them moist shady nooks. The sun in summer is more distressing to them than the cold of winter.

Auriculas are now in full beauty in cold frames. These are so easily managed in this way that they ought to be taken up by many who can afford a frame in a shady place in summer. A bunch of *Auriculas* when cut makes a sweeter and prettier nosegay than almost any other Primrose. The old-fashioned double white Primrose has been in bloom more than a month, and is now turning pink, but it has been in bloom in good condition for a longer time than usual with Primulas. This was wintered with the *Auriculas*, and is very easily propagated by division; seeds are not produced.

The long-continued dry weather is somewhat unusual at this season, as we have had no rain for four weeks, and the consequence is manifest in the *Narcissus*-beds; the flowers are coming short-stemmed, and water is sadly needed at the roots. This season, as last, *N. bicolor præcox* was in bloom a week before any other kind, and a few days ago it was the only kind in bloom but *Ard Righ*. *N. obvallaris* and *Golden Spur* soon followed, and we have now over a dozen kinds in full bloom.



Fig. 36.—*Narcissus monophyllus*.—See page 209.

There is a great future for *Golden Spur* and *Countess of Annesley* (the *Castlewellan Daffodil*), the last being especially free-blooming and vigorous, increasing threefold annually. By the time this is published the best kinds will all be in bloom.

Salvia argentea is a plant usually grown as an annual for the beauty of its foliage, and in the early part of the day when sparkling with dew it presents a pretty picture in the front row of a border. It was a surprise to see plants set out last year



Fig. 37.—*Narcissus incomparabilis*.—See page 209.

coming up strong and unharmed by the winter, as there are no other *Salvias* that will live out unurt in this locality, and even the garden Sage has to be treated as an annual. Every spring one is tempted to ask why *Mertensia Virginica* is so seldom seen in gardens, since there is nothing more beautiful in its season. It is very plentiful and easily obtained in some sections, but rarely seen in gardens. The beautiful blue flowers last well when cut.

South Lancaster, Mass.

E. O. Orpet.

Flowers in Bloom.

AMONG the flowers now in bloom is a distinctly colored Grape Hyacinth, named *Muscari Scovitzianum*, and a valuable addition to this interesting group. The long, prostrate leaves were produced in early winter. The flowers appeared in middle April. The flowers individually are rather small, but are of a beautiful opaque, pure blue, with no trace of purple, and with a white rim. Single bulbs have thrown three spikes of flowers. This would be a fine variety to associate with *M. botryoides alba*, whose pure white flowers are now in their prime. *M. Scovitzianum* is an introduction of Herr Leichtlin, as is also

Fritillaria Dalmatica, an interesting but not showy plant. The flowers are bell-shaped and single, on stems about six inches high, and droop gracefully. The petals are green outside, stained brown, and inside a deep brown, mottled and stained with green. In suitable positions, the dwarf and small-growing *Fritillarias* are interesting garden-plants, better adapted to the rockery than an open position, however.

The charming hybrid Primroses, with their bright flowers shining over a background of tender foliage, are among the choicest of the flowers of the season, and of the easiest culture. With me they prove very reliable, perfectly hardy in winter, and not burnt up by summer heat. I have before mentioned that they do well in my garden on a raised border, a few feet from the south side of the house, where it is often very warm. My friends at a distance, with some experience of Primulas, often express what I may perhaps call polite surprise at this fact. But it is only another indication that in our various gardens we have quite varied experiences. On my part, I do not know how others establish Primroses in grass, as one sees frequently noted and advised. In such cases it would be interesting to know what variety of grass is found suitable for the association. My garden being surrounded by vacant land, we are supplied with a large assortment of grasses, and apparently all of these, without exception, grow vigorously enough (outside of the lawn) to strangle anything but the most vigorous plants. My border of hybrid Primulas,

seedlings three years old, is of a vigorous strain (Dean's), but has been neglected. The crowns have not been divided and are much crowded. Where the grass had been taken out they are still vigorous, but most of the plants this spring were overcrowded with grass, and were rapidly becoming exterminated. Another strain of Primroses, not far removed from *P. veris*, shows even less vigor when attacked by grass. *P. elatior* (*Polyanthus*) has also largely disappeared under its encroachments. Primulas should, no doubt, be divided every second year at least, and given good culture, as they are gross growers and increase rapidly.

Auriculas are other members of the *Primula* family, now gradually showing their beautiful flowers. These alpine Primulas are kept under glass, to protect the meal from wet and to preserve the purity of the blooms. Choice Auriculas come under the head of precious flowers, and are well worth the care which they undoubtedly require. While they are hardy one does not care to plant out any but varieties discarded from the collection as not being first-rate, the others being kept always in pots or planted in a frame under shelter.

This is one of the oldest favorites of the florists' flowers, and the small but devoted band which makes them a hobby in England seems to me the most interesting group of flower fanciers. An Auricula fancier discusses the points of his favorite with an old-time ingenuousness and such a flood of reminiscences that one heartily enjoys his amenities and enthusiasm, while not caring at all whether the paste and the eye of the flowers are in proper proportion.

One of the Squills lately sent from the Taurus mountains is a variety of *Scilla bifolia*, named Whittall in honor of its collector. This variety is quite distinct, the leaves being more numerous than in the type, and channeled. The flowers are borne in long racemes and are upright. Individually they are small, with narrow petals, and somewhat resemble *Chionodoxa Sardensis*. The first sample of these, received in 1890, flowered earlier than the lot from a later collection.

A few lingering flowers of *Anemone blanda* remind me to say that though this valuable plant is perfectly hardy, it evidently has a choice as to suitable position. It does much the best with me in a warm snug corner, protected on all sides but the south, and where it is baked all summer. In this position it came into bloom in January, the tubers having been undisturbed for three years. Mr. E. Whittall sent me for trial last fall a large lot of what was said to be a finer and more robust form, *A. blanda robustus*. The tubers of these have not



Fig. 38.—*Narcissus triandrus*.—See page 209.

been so happily placed, being in colonies in more exposed positions, and though, as was to be expected of newly collected pieces, not flowering freely, yet they seem still more affected by being planted in exposed positions. Such flowers

of this variety as have appeared give indications of being very handsome. Herr Leichtlin's varieties, *A. blanda alba* and *A. blanda Cypriana*, have also, in exposed positions, confirmed the

far been very cool, and *Scilla Sibirica* and *Chionodoxa Lucillæ* have been in fine condition for a long time. One or two hot days will finish them.

Wellesley, Mass.

T. D. Hatfield.



Fig. 39.—*Narcissus rupicola*.—See page 209.

conclusion stated, that protection and subsequent baking are desirable for these plants.

Elizabeth, N. J.

J. N. Gerard.

***Campanula pyramidalis*.**—Contrary to expectation this plant has proved quite hardy here where the commoner *C. Medium* died. It is one of the very best for pot-culture, having a compact self-supporting habit. Compared with the Canterbury Bell the flowers are small, but they make up for their lack of size in number. They come into bloom early in June, and are very useful for standing on steps and about entrances of residences.

Although a true perennial, when grown in pots it is better treated as a biennial, as excessive blooming destroys the symmetry of the plants, so desirable when grown as specimens. Seeds sown in spring will produce fine crowns for potting into nine-inch pots in the autumn. It is better to store the plants in a frost-proof pit, otherwise they will lose their lower leaves, and look leggy. As single specimens in a rock-garden this *Campanula* serves in a charming way to break up the monotony so often noticeable where nothing but low-growing herbaceous or alpine plants are used. For this purpose the white variety is the more effective.

***Alstroemeria pelegrina*, var. *alba*,** the "Lily of the Incas," is described in European catalogues as tender, and it is further recommended that "a warm spot be selected for it." The further my observation goes the more I am convinced that the test of hardiness is not in proportion to the lowness of temperature. This plant has proved quite hardy here for two winters, even in exposed situations. It will be fortunate if this lovely Amaryllidaceous plant should prove quite hardy, being an excellent subject both for border and cutting purposes. Plants come quite easily from seed or by division of the roots.

Medinilla magnifica is now in bloom in the tropical plant houses belonging to H. H. Hunnewell, Esq., Wellesley. It comes from the East Indies, and was once commonly grown, no collection of flowering stove plants being considered complete without it. It is gorgeous when in bloom, with long verticillate, drooping panicles of pink flowers; the appendiculate anthers, a character peculiar to all Melastomaceæ, are strikingly conspicuous. When out of bloom it is a very ungainly shrub, very subject to insect pests, particularly the mealy bug.

Primula rosea is very bright this spring. It easily loses color, and is past very quickly if the weather is unseasonably warm, as is often the case during April. This spring has so

The Forest.

The Forests of California.

AT the last meeting of the American Forestry Congress, Hon. William Alvord, the president of that body, read a paper on this subject, from which we make the following extracts:

There is much about the silva of California that is broadly distinctive, and not met with in any other part of the world. Some of the trees are larger and probably older than any found elsewhere, except perhaps among the Eucalypts of Australasia, and they are not confined to small groups or belts, but are in great forests, some of which cover areas nearly as large as the whole of New England. There are millions of trees any one of which would yield enough lumber to build a good-sized house. Twenty millions of acres of California are covered with magnificent forests; the remainder is sparsely wooded or wholly treeless.

The heavily timbered districts are confined to the Sierra Nevada mountains on the east, the mountainous regions in the northern half of the state, and what is known as the Redwood belt, lying along and adjacent to the north-western sea-coast. The heavily timbered portion of the Sierra Nevada covers a territory five hundred miles long by seventy wide; the Redwood belt and the timbered mountains at the north comprise nearly half as much more. The whole aggregates about 50,000 square miles of lumber-producing forests for the entire state, which contains 158,000 square miles.

There occur in other sections of California patches of lumber trees, the most important of these being in the Central Coast Range and in the San Bernardino and Kingston mountains; the product of the latter, situated in the desert regions of the south-east, is more valuable for fuel than for building material. The inferior growth consists mainly of several varieties of Oak and Pine, with some Madroña, Maple, Walnut, Alder and Ash; the Sycamore, Willow and Cottonwood grow along the water-courses and in other moist localities. The few trees that grow in the desert-lands in the south-eastern angle of the state are the Mesquit, Palm and the Paloverde; the Palms, of which there are several varieties, are almost worthless, being alike unfit for fuel or lumber, and they do not bear edible fruit nor furnish shade. These and the Cactus are signs of aridity and barrenness.

The chain of mountains which skirts the easterly border of the state has an average height of about 8,000 feet, with long stretches much higher, some of the peaks attaining an altitude of 14,000 feet. The Piedmont country on the west, which attains an elevation of about 2,000 feet, and varies in breadth from fifteen to twenty-five miles, is covered with a sparse growth of scrubby Oaks and Pines; at the upper edge of the domain the more stately and valuable forest begins. While the foot-hill Oaks are of several kinds, the Pines are mostly confined to a single variety, the *Pinus Sabiniana*, called by Californians the Digger or Nut Pine. The last name is given it on account of its edible nut, which constitutes one of the staples of subsistence of the Digger Indian. The Nut Pine, though little fit for lumber, makes a fuel nearly equal to Hickory, and serves tolerably well for mine-supports. Mingling with the Oaks and Pines are various dwarf trees, also much shrubby, chiefly the Ground Oak, Chemisal, Buckeye and Manzanita. These are worthless save for firewood, and they are being cleared off in many places since the ground is found to be excellent for fruit-trees, and many orchards are being set out here.

Leaving the Red foot-hills we enter the zone above, with its steeper acclivities and its wondrous wealth of woods. While nearly all that is valuable consists of conifers, there are Oaks and many other deciduous trees in considerable numbers up to a height of 7,000 or 8,000 feet; also the Nut Pine up to 4,000 feet. This is the only conifer that does not thrive at a higher level.

While there is considerable shrubbery at these levels, the forests are so little obstructed with undergrowth that a wagon can be driven through them almost everywhere without much trouble. The woods lower down are still more open. The forests in this higher zone take in nearly the entire cone-bearing family, the Pine, Spruce, Fir, Cedar, Juniper and Cypress being represented, and they thrive in all latitudes and levels

up to about 9,000 or 10,000 feet. Above this the trees dwindle in size and the wood deteriorates in quality. At about 12,000 feet of altitude vegetation ceases, the mountains above are of naked granite and mostly covered with snow all the year round. In the high and heavily timbered lands the conifers are represented by fourteen genera and fifty-two species, there being sixteen or more species of Pines, all somewhat different from their eastern congeners.

After leaving the foot-hill country the first of these majestic trees encountered is the Yellow Pine (*Pinus ponderosa*), a tree of most noble presence. It is widely disseminated from central Oregon south to Mexico, and laterally from the Coast mountains east, across the cascade and the Sierra Nevada ranges. In size and in value for lumber it ranks next to the Sugar Pine, which comes in a little higher up. In the mountains lying toward the sea, as also in the arid interior, the Yellow Pine is considerably smaller, but on the Sierra it attains a height of two hundred to three hundred feet and a diameter of ten to fifteen feet. It is among the best of our timber-trees, the wood being soft yet firm and unusually heavy. A greater amount of lumber is made from it than from any other tree in the Sierras.

At an elevation of about 3,000 feet the Sugar Pine (*Pinus Lambertiana*) begins to appear; its best development is reached at about 5,000 feet, and it extends the whole length of the big timber-belt and covers a zone from twenty to thirty miles in width. Its grand colonnades run parallel with the general trend of the Sierra. In size it ranks next to the *Sequoia gigantea*, which in all other respects it excels. As a lumber-tree it has no superior. The wood is nearly white, close-grained and solid. No other timber works so easily, nor does any other crack or warp so little, for which good qualities it is in great demand for cabinet-work and interior finish. It is largely used on the Pacific coast, and there is an export demand for it. The sugar made from the sap which exudes from it when cut or otherwise wounded, is utilized for food by the Indians but is not relished by the whites.

Being so valuable for lumber the destruction of the Sugar Pine has been rapid, both the saw-mill man and the shake-maker having until recently been allowed to deplete upon these trees at pleasure. As many of them do not split freely, it was the practice of the early shake-maker to fell one tree after another until he had found one that would rive to suit him. The rejected trunks were left to rot on the ground or to be consumed by the sweeping fires so common in these forests. Under this practice thousands of these trees were destroyed for no other purpose than to prove to the satisfaction of these vandals that they did not split freely. Through the enactment of laws sufficiently stringent to terrorize this class of woodsmen, our Sugar Pines and other valuable trees are now pretty well secured against such wanton and criminal waste.

The white Silver Fir, by reason of its great strength and durability, is much sought after for railway-ties, bridge-building and mine-timbers. Some varieties of the Spruce and Hemlock also make a tough, but rather coarse lumber. The home of these trees, which nearly equal the Yellow Pine, extends along the whole length of the Sierra, reaching laterally from 3,000 to 8,000 feet, the best being found about midway of this belt.

The Incense Cedar (*Libocedrus decurrens*) is another most useful and widely disseminated tree, its habitat reaching from southern Oregon to Mexico, and from 2,000 up to 6,000 feet above the sea-level. In height it ranges from 100 to 150 feet, in diameter from three to six feet. The timber is adapted for a great variety of uses, being light, durable and strong; it is used in railway, ship and boat building. Having a straight grain and riving freely, great quantities of it are split into shakes and pickets, and formerly it was made into clapboards. The bark is thick and tough, and excellent for filling in boggy places in road-building. This Cedar is never found in groves, but is scattered through forests of the Sugar Pine, Yellow Pine, Spruce, Fir and Hemlock, and is often called the White Cedar of California.

Correspondence.

German Forests as I Remember Them.

To the Editor of GARDEN AND FOREST:

Sir,—My memory runs back to the Revolutionary riots which took place in Germany in 1848, when the enraged people resorted to acts of violence in revenge for existing evils. Vibrations from the centres of fermenting dissatisfaction in Paris, Vienna and Berlin had reached provincial cities, and my native place in Mecklenburg was not exempt from this disturbing

visit. Here the rage of the people was directed mainly against the head, or, as he was called, the Senator of the Forest Department, which was a distinct branch in our municipal government. The furious mob, not finding his person, demolished all his belongings, and not a particle of what could be broken in or about his house escaped destruction. Now, why was this punishment inflicted upon him? The charge was that he had appropriated to his own use certain sums received from the sale of timber and wood, and, what was considered a still more serious offence, he had ordered more trees to be cut from the forests than had been allowed by the higher authority, which consisted of a committee of representative citizens appointed for this purpose, whose duty is to designate at certain intervals those trees which, on account of interference with the growth of others or for some other cause, it was thought best to dispose of.

In well-regulated communities the preservation of the forests is a matter of the greatest concern to the inhabitants. With us they brought in certain valuable revenues to the income of the city besides conferring direct benefits to individual citizens. For centuries certain inalienable rights had belonged to the lots on which our houses had been built, under which, according to their valuation, a certain amount of wood could be had for the simple fee of cutting. Persons who did not own real estate, after securing permission which cost nothing, although it was placed upon record, might gather the dry wood which they needed on designated days and in certain places under the supervision of the City Forester or his aids. They could use a wheelbarrow for carrying and a hook to break the dry branches, but no hatchet could be carried. Any one who might be discovered carrying a concealed hatchet had his permission at once revoked. The dry leaves or Pine-needles were also gathered under restriction. The people had learned through centuries of experience, dating back to the times before the Roman occupation, that their forests protected them and helped to provide a means of living for them, and therefore they have always been held in veneration. The result of this long experience is a well-regulated system of tree-culture. It is a luxury to walk through some of these groves. In the oldest sections the giant trees stand in such regular rows as to suggest the thought that they had been originally planted at regular distances.

When wood is sold for building purposes or for use to the different artisans, such as coopers, wagon-makers and joiners, auctions are made, and no one from another place is allowed to bid for it, the privilege belonging exclusively to the residents and citizens. Even the stumps of the trees are dug out and sold for firewood to brick-makers and bakers. In the Pine-woods the long roots are carefully gathered and worked into baskets and similar utensils. Pea-brush, bean-poles, Christmas-trees and decorative greens are cut under supervision, and no slashing and hacking to the right and left is allowed. Now, what is the result of all this care? The people point with pride to their forests, which are wealth to them and a blessing in many educational ways. A fire (*Waldbrand*) is considered a calamity of the direst sort. In the dry season, when leaves have fallen, no smoking is allowed in the woods. Such historical forests as *Wienerwald*, which belongs to Vienna, the *Spreewald*, which belongs to Berlin, and many others are places of renown, but less famous ones scattered throughout the country are cherished and loved by the people beyond description. They feel that they could not exist without them. Besides the value from their wood and protection, in other ways they have great historical interest. Here, we have been taught, are the remains of the graves of the Huns, and here the caves where the Vikings lived and hid their treasures. Here, again, are beautiful openings, where are found such floral treasures as the odorous Violets and Lilies-of-the-valley. In the dark Oak-woods we may startle some deer or wild pigs, and in the Beech-woods are the "horsts" of aromatic berries, and the Woodruff (*Asperula odorata*), which grows in such great clusters that the whole population goes out to gather it for decorating the houses when they plant the May-bush, and all the doorways and stairs are entwined with it at the *Pfingsten* celebration.

We German people miss our forests when coming to this country. We had read the descriptions of the great woods in Fenimore Cooper's Indian tales, but too often we have found nothing but second or third growth trees with tangled underbrush, or burned stumps which told where trees had once stood. It would be well if our people could realize that in the care of their woodlands there lies a refining influence which helps to make a strong home sentiment and nobility of character. We cannot overestimate their economic value, but if every town and village had its forest, in which all the people

felt an affectionate interest, it would strengthen local attachment and add a fresh charm to rural life.

Hartford, Conn.

Wilhelmine Seliger.

Hardy Plants at Short Hills.

To the Editor of GARDEN AND FOREST:

Sir,—It would add very much to the attraction and probably the property value of the average American village to follow the example of Short Hills, New Jersey, and make the vicinity of the station and entrance to the hamlet picturesque. Certainly the requirements are very simple and the expense very slight, the details being only well-kept paths and roads and well-arranged clumps of shrubs, the commonest of these being the best for the purpose. The Spiræas, Forsythias, Japanese Quinces and others at this season make such beautiful masses, that, familiar as they are, we gain pleasure from them at every view, and even those who are whirled through Short Hills on the train must carry away a pleasing impression.

Looking over the hardy-plant nursery of Pitcher & Manda, which occupies the area nearly opposite the station and borders on the main drive, where handsome plantations are maintained, I was reminded of a late editorial of GARDEN AND FOREST calling attention to the fact of our great dependence on bulbous plants for an early display of flowers in this latitude. Of course, few bulbous plants except surplus stock are planted out in a commercial establishment, and the season so far having been abnormally cold herbaceous plants have made little progress. *Adonis vernalis* seemed least affected by chill, and its cheerful flowers and bright foliage made handsome clumps of color. The *Aubrietias* were well forward, *A. Eyrii*, *A. Græca* and *A. purpurea* coming on in the order named. If planted on a rocky these valuable plants would be still earlier. The Dwarf Phloxes, *P. subulata* and *P. amœna*, were well forward, while in a damp spot the double-flowered Marsh Marigold (*Caltha palustris*) was covered with its Buttercup-like flowers. In the frames *Primula Sieboldi* was covered with its graceful clusters of red flowers. There were also stray flowers of *Papaver alpinum* and a few lingering *Hellebores*. Of the large variety of Irises grown only *I. biflora* was showing flowers, in shades of purple. This seems in the way of *I. pumila*, very dwarf, and suitable for dry edgings. In one of the houses was a collection of herbaceous material which had been forced for Easter. The *Pæonies* were well grown and flowered, and seem valuable for gentle forcing, and certainly make bold decorations. Some Foxgloves were about as good as one sees in the open. A large stock of *Azalea Indica* and *A. mollis* is also carried here, and perhaps the most enjoyable part of the establishment at this season is the section containing these beautiful plants—brilliant above most others. It speaks much for the demand for Orchid-flowers that in the houses containing so many thousand plants there is scarcely a flower to be seen, the demand at Easter having taken every available flower on the place, with inquiry for more. Several scores of cases of Orchids were just arriving from collectors in South America, a field which the firm seems to have entered in full force. One might pass a day very pleasantly in wandering through the Palm-house and the numerous side houses, which contain wonderful collections of Bromeliads, Ferns, *Dracænas*, *Anthuriums*, *Crotons*, *Nepenthes*, Palms, etc. In the Fern-house was a grand specimen of the new *Pteris Victoria*, one of the most beautiful introductions of recent years. A curious thing is the Shingle-plant (*Rothos flexuosus*), an Aroid from India, which, growing on a block or wall, creeps up with rooting-stem and throws out leaves alternately to right and left, which partly overlap and lie flat. *Calamus ciliaris* is a rare Palm with fine foliage, which is wonderfully soft and velvety to the touch.

New York.

G.

Sabal Palmetto.

To the Editor of GARDEN AND FOREST:

Sir,—The editorial reference in GARDEN AND FOREST to a letter of Monsieur Naudin on the absence of the Sabal Palmetto in the gardens of southern Europe is of interest in southern California. We also have had no success with this Palm. The only living specimen that I know of is on the Kirmeloa Ranch. This Palmetto is now twelve years old, and yet it is still no tree. The trunk is three feet from the ground to the leaf-stalks. These are long, and look vigorous. The handsome crested curve of the new leaves is very marked. In the same garden there are a number of other Palms, all of which make a fine showing for their age (twelve years). The California Palms, for instance (*Washingtonia filifera*), are in a num-

ber of instances over fifty feet high. The *Chamærops* are between twenty and twenty-five feet, and the Date Palm, which is a slow grower, about the same. This garden is exceptionally well situated for the *Magnolia foetida* (*grandiflora*), for the most vigorous specimens of this beautiful tree in southern California are found there. As this tree is a native of the south, like the Palmetto, it would seem a reasonable presumption that the Palmetto should at least do as well in this garden as anywhere in this section. The *Magnolia*, as a rule, does not make a large tree in southern California. Speaking generally, it is most successful when near the coast. In the interior, where the air is very dry, it is smaller and flowers but little. At Riverside it lives, but amounts to nothing. My idea is that the long dry summers, with cool nights, are unfavorable to both the *Magnolia* and the Palmetto, but less so to the *Magnolia*. The *Magnolia*, while never so large as in the south, is still a favorite ornament in our Coast belt. The Riviera, like southern California, has a comparatively dry climate and cool nights, but it has a lower average winter temperature and naturally an inferior soil. The dryness common to both these climates may be the common cause for the practical failure of the Palmetto.

Lamanda Park, Cal.

Abbot Kinney.

Araucaria excelsa.

To the Editor of GARDEN AND FOREST:

Sir,—May I ask for some information about the beautiful evergreen, *Araucaria*, which we see offered so abundantly in the florists' shops in New York? What is its home and history?

New York.

J. W. K.

[This *Araucaria* is a native of Norfolk Island, and it is frequently known as the Norfolk Island Pine. It is only within three years that the value of young trees for decoration has been appreciated in this country, and last year it was extensively used on or about Christmas. The plants are propagated either from seed or cuttings, both being rather unsatisfactory, as it is difficult to import seeds fresh enough for germination, and, on the other hand, the plants furnish but few cuttings, and these are difficult to root. They must be grown in a cool greenhouse, with an abundance of air and moisture at the roots. Plants raised from cuttings are generally more bushy than those raised from seed, which are spindly and not so well furnished at the base. The great majority of plants used here are imported.—ED.]

Notes.

Mr. Gifford Pinchot, of this city, has been appointed to make the collection of woods from the state of North Carolina for the Columbian Exposition.

Iceland Poppies are opening in the gardens about this city, although the plants were covered with three or four inches of snow a little more than a fortnight ago.

Several forest-fires, of an extent which would excite comment even in this country, have recently occurred in Prussia, devastating large areas near Berlin and near Werdohl, and destroying 1,750 acres of good timber in the vicinity of Niebeck.

The Norway Maples near this city are flowering in unusual abundance this year. Many of the trees are completely covered with clusters of light straw-colored blossoms, and their round heads are conspicuously beautiful now in the sunshine.

In the neighborhood of this city very many *Retinosporas* and other coniferous evergreens have died during the late winter and early spring. In many cases the trees seem to have been injured by high winds and a low temperature which followed close after a very few warm days in early March.

Our native *Carpinus*, or Hornbeam, is one of the most ornamental of our small trees. Its clean Birch-like foliage in the summer, its furrowed bark in the winter, and its trim appearance at all times should encourage its more general use. For a week or so past its catkins have pushed suddenly forward before the leaves so as to cover the tree with a mist of soft green, and present a special feature of the landscape on the borders of swamps and streams.

A correspondent of *The Garden*, London, remarks on the deficiency of color in the English Daffodils this year. In the springs of 1890 and 1891 the crowns of several varieties of the *Incomparabilis* class, such as *Leedsii*, *Cynosure*, *Princess Mary*,

etc., were remarkable for the brightness of their orange tints. This year they have not a single tint of orange. It is suggested that this lack of deep color is due to unusually rapid development. There certainly is a marked variation in the color of the same flower in different seasons, and the causes of this variation suggest an interesting field for investigation.

In order to discover the amount of copper which remained on fruit from vines sprayed with the Bordeaux mixture ten pounds of grapes at the State Experiment Station in Amherst were taken, and the bunches selected were those which had the largest amount of copper mixture adhering to them. In one sample not a trace of copper could be found, and in the other two one-thousandths of one per cent. of oxide of copper was found, an amount so small that one would need to eat from half a ton to a ton of these grapes, stems, skin and all, to obtain any injurious effect.

In Mr. Blomfield's recently published book on *The Formal Garden in England* he quotes from a sixteenth century author, who, in writing upon house-building, declared that the chief prospect of a house ought to be east, and especially north-east, because the "est wynde is temperat, friske and fragrant." Other English authors of the time repeated this assertion, which seems curious enough to those who know what the east wind really is in England; and the fact, says Mr. Blomfield, shows how writers of that period borrowed wholesale from the Italians, "without either acknowledging the source or correcting their statements by local experience."

In a late bulletin from the United States Department of Agriculture on spraying fruits it is estimated that no less than 50,000 fruit-growers in the United States habitually spray their trees and vines against such diseases as the apple scab, the black rot of the grape, etc., while five years ago there was practically nothing known of the subject. In order to get a direct answer to the question whether this practice paid, 250 grape-growers in different parts of the country last year made a series of observations for the purpose of obtaining definite information as to the value in dollars and cents of the spraying treatment for grape diseases. The facts reported by these men show that the actual profit to them over all expenses resulting from the treatment of black rot and downy mildew was \$37,000.

In *Mechans' Monthly* for May there is a note from Professor Maisch on a remedy for poisoning by species of *Rhus* which is worth trying by all who are susceptible to injury from these plants. The remedy is as follows: Saturate a slice of bread with water, cover one surface of the slice with finely scraped washing-soda, and apply this side to the affected part. If the bread becomes dry drop water on the outer side, so as to keep it thoroughly moistened, and remove the poultice in about twenty or thirty minutes. If necessary, it may be applied a second time in the course of a few hours. Another remedy for the same poison is given in the same magazine by Mr. John M. Dunlop, of Milwaukee. The remedy is to paint the parts affected with collodion with a small brush. It shuts out the air and affords instant relief.

The city of Genoa proposes to solemnize the fourth centenary of the discovery of America by international congresses of societies of geography and natural science; and the Italian Botanical Society invites the botanists of all nations to assemble in Genoa on the 4th of September. The Botanical Congress will last until the 11th, and the Italian Botanical Society is arranging for various excursions* on the shores of the Mediterranean and in the Maritime Alps. During the Congress the new Botanical Institute, built and presented to the University of Genoa by Mr. Thomas Hanbury, will be inaugurated, and an exhibition of horticulture and of products exchangeable between America and Italy will be held. Inquiries and communications concerning the Botanical Congress may be addressed to Professor O. Fenzig, of the University of Genoa.

The European horticultural papers have been lamenting the destruction of wild Daffodils in the Basses Pyrenees. Mr. C. Wolley Dod, writing to the *Journal of Horticulture*, states that among indigenous kinds *Narcissus Bulbocodium*, var. *citrinus*, extends over so much territory that, in spite of orders for hundreds of thousands of bulbs, it is in no danger of extermination. The variety *Pallidus præcox*, of *N. Pseudo-narcissus*, has been severely taxed by eradicating collectors for the English market, but for all this it is still abundant in the woods and multiplies so rapidly from seed that it only needs a few years of peace to be as abundant as ever. Besides this it is being largely cultivated, and as the people find how easy it is to raise the bulbs from seed they will hardly go to the trouble

of collecting wild ones from less populous parts of the Basque country.

The Clark Memorial Medal has recently been awarded by the Royal Society of New South Wales to Mr. W. T. Thiselton-Dyer, Director of the Royal Gardens at Kew, for services rendered to the colonies in India through his admirable organization and administration of the Royal Gardens, which have resulted in a system of cohesion and co-operation between that establishment and the botanical gardens of the British Empire. This is the third time the Clark Memorial Medal has been awarded to an official connected with the Royal Gardens, it having been previously bestowed on Sir Joseph Hooker for his work in elucidating the Flora of Australia, and later upon Mr. Bentham for his classical Australian Flora. Those persons who are familiar with Mr. Dyer's remarkable executive capacity and with the state of proficiency to which he has raised the establishment under his charge will hardly agree in his own underestimate of his services as set forth in his letter of acknowledgment, or feel with him that his work has only been the humble one of continuing the traditions which have made Kew as much an imperial as a local institution.

Experiments for protecting the fruit-buds of Peach-trees from injury by cold during the winter have been made for several years at the Massachusetts Agricultural College, and for four years past in the early winter the roots of several of the trees have been loosened on the north and south sides and the trees laid over on the ground. In this way, if the roots are cut off during early summer, the growth will be forced into the roots on the east and west sides, and these will be simply twisted a little in the process of bending over. The trees are bent toward the south to avoid the direct rays of the sun on the trunk and main branches. In the first experiment the buds were injured by heat because the trees were covered too closely; after that they were covered with mats and other light material, and a large percentage of the buds were saved. This spring, while about fifty-two per cent. of the fruit-buds were destroyed on unprotected trees, those which were protected show only ten per cent. destroyed. Many of the trees treated in this way are more than ten years old, and they are easily set up in the spring, grow well and mature a crop. No covering should be put on the ground under the tree, as the moisture seems necessary to keep the buds in good condition, and if the land is in sod the trees should be sprayed with the Bordeaux mixture and with skim-milk and Paris green to protect them from field-mice, which are very fond of them.

In the report of the Botanical Gardens of British Guiana it is said that there is as much difference between a good variety of mango and a bad one as there is between the choicest cultivated apple and the bitterest wild crab. No cultivated fruit rivals the better kinds of mango, while none is probably quite as low as the poorer kinds. By good kinds is meant those without fibre, which are true table fruits, with firm rich flesh, which can be easily cut from the seed. The inferior kinds have stringy flesh, which clings to the seed, and an unpleasant taste like that of turpentine. The range of color in mangos is as wide as the range of quality, some having a combination of tints more beautiful than those of the finest peaches and plums. Others are a beautiful golden yellow, and others still a dull soiled green. The color, however, is no indication of quality, as some of the worst of the stringy mangos are the most gorgeous in color. The mango is a native of India, from whence it has spread quite around the equatorial belt, although it did not reach the West Indies until the second half of the last century. Inferior kinds prevail there, however, because there has been small attempt to import the good ones, and the inferior kinds possess a greater constitutional vigor. Besides this, the peasantry, who are the chief consumers of the fruit, have no preference for the best kinds. The few good varieties which are known in British Guiana are now being propagated by grafting, but they are not at all abundant; indeed, no first-class mango has ever yet appeared in the fruit-stalls of the Georgetown market, nor have the great majority of the inhabitants of the land ever tasted one. There seems to be no reason why, with a proper selection of kinds, the mango should not be included among the ordinary cultivated glass-house fruits of temperate countries. No peaches, apricots, grapes or pineapples in the world rival those grown in glass-houses, and if skill were attained in their cultivation by practice it is probable that finer examples of the fruit of the Mango would be found in English glass-houses than in the tropics. The choicest kinds of Mango-trees might be grown in the great glass buildings at Kew, but there are many dwarf kinds which might be grafted and easily kept to a height of eight or ten feet, and the same diameter of branches.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLES:—The American Hawthorns. (With figure.)	217
The Love of Nature.—III.	218
The Forests of India.	219
The late Sereno Watson.	Professor Wm. H. Brewer. 219
Spring in the New Jersey Pines	Mrs. Mary Treat. 220
PLANT NOTES:—Some Recent Portraits.	220
FOREIGN CORRESPONDENCE:—London Letter	W. Watson. 222
CULTURAL DEPARTMENT:—The Cultivation of Ginseng.	G. Stanton. 223
Foliar Nematodes. (With figure.)	Professor Byron D. Halsted. 224
Euphorbia Jacquiniflora.	O. O. 224
Notes on Species of Tulips.	Max Leichtlin. 224
Seasonable Work.	W. H. Taplin. 225
How Some Half-hardy Shrubs Survived the Winter.	J. G. Jack. 225
CORRESPONDENCE:—Spring in Boston—A Foreigner's Impressions.	C. Waern. 226
Bird's-foot Violets in Cultivation.	Caroline A. Farley. 226
RECENT PUBLICATIONS.	227
NOTES.	228
ILLUSTRATIONS:—The White Thorn (<i>Crataegus mollis</i>) in New England, Fig. 40.	221
Leaf attacked by Nematodes, Fig. 41.	224

The American Hawthorns.

OUR American forests are rich in Hawthorns, nearly one-third of the forty species which are now known being found within the territory of the United States. They are scattered from Newfoundland to Vancouver Island and to Florida and Texas, and every state and territory, with the exception of Arizona, contains its representative of the genus. They are more common, however, in the east than in the west, and in the number of species and individuals the south is richer than the north. They abound in the country between the Red River and the Trinity, which must be considered the head-quarters of the genus, as more species occur there than in any other region of similar extent, while individuals of several species grow in greater abundance and luxuriance there than in any other part of the country.

The American Hawthorns have long puzzled students of trees, and botanists have regarded them as difficult subjects. But it is the botanists themselves, rather than the peculiarities of these trees, which have made them hard to understand, and the chief difficulties in elucidating the different species are literary, and not morphological. For many of the species having been early introduced into the gardens of Europe, there developed under cultivation, numerous more or less distinct forms which were described as species, and often as genera, different names being sometimes given to the same cultivated form. This making of species went on for a century in nearly every country of Europe, while in America botanists were hardly less active in burying these unfortunate plants under a load of almost inextricable synonyms. It is, nevertheless, possible to obtain a correct idea of the species if the student will remember that two Hawthorn-plants raised from seeds taken from the same tree may be and probably will look very unlike one another and their parent; that individuals of most of the species vary in the form of the leaves, in the amount and character of the hairs which cover them,

in the presence and absence and in the size and character of the glands which are often found on their leaves and calyx-lobes, in the size and shape of the stipules, which vary on different parts of the same individual, in the number of styles and of the nutlets of the fruit, which is sometimes round and sometimes pear-shaped, and red or yellow in the same species. The student of trees must remember, too, that climate and environment modify individuals, and that when a species has a north and south range of two thousand miles an individual at the north may look very different from one which has grown in the extreme south. If all these facts are remembered, a patient observer able to keep his mind clear of the pitfalls in synonymy dug by Moench and Willdenow, by Aiton and Du Mont de Courset, and by Rœmer, Wenzig and Keleniczko, and with abundant opportunities for studying in their native forests the different species in all parts of the territory which they inhabit may be able at the end of twenty years, perhaps, to recognize the different species and find characters for separating them, although botanists will probably never agree whether certain forms shall be called species or varieties.

The American Hawthorns fall naturally into two groups; the first contains those species which produce large many-flowered compound corymbs, and the second those species with simple few-flowered corymbs. The species of the first of these principal divisions may be divided into three groups; the first with black or blue fruit, the second with large scarlet or yellow fruit, and the third with minute scarlet fruit, while the species of the second of the principal divisions fall naturally into two groups, the first with red or greenish yellow fruit, and the second with large globose red fruit. These divisions being established, there is nothing better than the shape of the leaves, in these plants a variable and therefore unsatisfactory character, by which to distinguish the species.

It is not our purpose to describe here all the American Hawthorns in detail, but rather to call attention to the value of the genus as a good subject for study, promising our readers that they will find in it much interest and excellent opportunities for intellectual development, and to remind cultivators that some of the species are beautiful and desirable garden-plants still too little known or appreciated in their native land.

From a gardener's standpoint the most desirable of our Hawthorns is *Crataegus Crus-galli*, the Cockspur Thorn, which is perhaps better known in cultivation than any of the other species. Its hardiness, the beauty of its lustrous foliage, the lateness of its flowering-time, all recommend it. The head of this tree, which is sometimes round, with pendulous branches, and sometimes flat-topped, with spreading horizontal branches, is always handsome and interesting. The autumn color of the leaves is not surpassed by that of any of the species, and the abundant fruit hangs on the branches without changing color throughout the winter. The Cockspur Thorn is little subject to fungal diseases, which disfigure many Hawthorns, and it is usually long-lived in cultivation. The long thorns which arm its rigid branches make it a good hedge-plant, and early in this century it was much used for this purpose in some of the eastern states. In the form of its leaves the Cockspur Thorn is one of the most variable of our species, and in addition to the varieties which are found growing wild in different parts of the country others have appeared in European gardens, where this species has been cultivated for nearly two centuries, and where it is now more often seen than any other American Hawthorn.

Of the broad-corymbed large-fruited species the White Thorn is, next to the Cockspur, the best garden-plant. This tree has been considered a variety of the Scarlet Thorn and also as a species. Perhaps the latter view is the most sensible, as the two plants differ in size and habit, in the size of their flowers and the time of their appearance, in the size of the fruit and the length of time this remains on the branches, as well as in the pubescence

which covers the under surface of the leaves and the young branchlets. *Cratægus mollis* is the name the White Thorn must bear if it is considered worthy of specific distinction. It is the largest of the Hawthorns of the northern states, and one of the most widely distributed of the American species growing from the shores of Massachusetts Bay to Missouri and through Arkansas to Texas and the mountains of northern Mexico. It is one of the common species in the states west of the Mississippi River, growing to its greatest size in Texas. In cultivation the White Thorn is a beautiful plant, of rapid growth and good habit, conspicuous in winter for the whiteness of its branches and for the number of its large chestnut-brown shining spires. The flowers, with the exception of those of one species of the southern states, are the largest produced by any member of the genus. The leaves are large and of a lively green, and the fruit, which is as large as that of a small crab-apple, is brilliant scarlet with a conspicuous bloom; unfortunately, it falls as soon as it ripens. Some idea of the beauty of this tree when its flowers are open can be obtained from the illustration on page 221 of this issue. It has been made from a photograph of a tree grown in New England, for which we are indebted to Dr. William H. Rollins, of Boston.

The Washington Thorn of the small-fruited species is the best known in gardens; it is the *Cratægus cordata* of botanists, an inhabitant of the southern Appalachian region, and rather a rare plant in its native wilds. It is, however, better known in gardens than any of the other species of the southern states, and its vernacular name is due to the fact that early in the century it was introduced into eastern Pennsylvania as a hedge-plant from the neighborhood of the city of Washington. It is a handsome small tree with an oblong round top, bright triangular leaves brilliant in autumn, and small flowers which open later than those of any of the other species, and bright scarlet fruit the size of peas, which hang on the branches until the leaves appear the following spring. The Washington Thorn is free from serious fungal diseases and is always a satisfactory tree in cultivation. Fifty years ago it was more often planted than it is at present.

An interesting garden-plant, also, is *Cratægus Douglasii*, the only representative of the genus in the coast-region of the north-west and in California. In the warm climate of Washington and Oregon this tree often attains the height of forty feet and forms a trunk a foot and a half in diameter. The leaves are large and lustrous, the flowers are small but very abundant, and the fruit, which is black, falls in early autumn as soon as it ripens. It is one of the few trees of western America which are absolutely hardy and satisfactory on the eastern edge of the continent, where it thrives as far north as Nova Scotia.

Some of the most beautiful of our Hawthorns were once cultivated, but have long been lost from gardens, and a few have never been cultivated at all. *Cratægus flava*, a native of the maritime regions of the south Atlantic and Gulf states, where it grows in the arid sandy soil of the Pine-barrens, was first described a century ago from plants cultivated in England at that time and the source of endless confusion in the literature of the genus, probably long ago disappeared from gardens, although the name still appears in most garden lists. It is a beautiful small tree, with a narrow round-topped head of graceful pendulous branches, large flowers in two or three-flowered corymbs, and pear-shaped greenish yellow fruit. The Parsley Haw, another inhabitant of the southern states, and beautiful from the shape of its finely divided leaves, was once cultivated in English gardens, from which it has, however, long ago disappeared. But the most beautiful of the southern Hawthorns are still unknown in gardens; these are the Pomette Bleue, of the Acadians of Louisiana, and the Summer Haw, of South Carolina and the Gulf states. The first of these, *Cratægus brachyacantha*, although it is one of the largest and most distinct of the whole genus, strangely escaped the knowledge of botanists until very recently, although it was collected long ago without flowers and fruit. It is the

most local of all our species, growing only in the extreme western part of Louisiana, where it borders in broad groves, small low prairies, and in the adjacent portions of Texas. It is perhaps the largest of the genus, sometimes rising to the height of fifty feet, with a tall straight trunk and slender branches, which form a beautiful compact round head. The leaves are not large, but they are bright and shining, and the flowers, which are comparatively small, are produced in many-flowered clusters, which completely cover the branches. The fruit is large and abundant and is bright blue—a color otherwise unknown in the fruit of *Cratægus*. Unfortunately, it falls in early autumn. There is not a more beautiful small tree in the southern states than this, and it is to be hoped that the attempts made a few years ago by the authorities of the Arnold Arboretum to introduce it into the temperate countries of Europe will prove successful. In the Arboretum itself the seedling-plants have not proved hardy.

That no recorded attempt has been made to cultivate *Cratægus æstivalis*, the May Haw, and that no figure of this beautiful plant has ever been published, are remarkable facts, although botanists have known of its existence for more than a century. Unlike our other Hawthorns, it flowers before the leaves appear, in February or March; the flowers are larger than those of any other species, and the fruit is larger and of better flavor and quality than that produced by any other *Cratægus*. It is as large as a medium-sized crab-apple, bright red with pale spots, and ripens in May. Pomologists might well devote some attention to this tree, for excellent jellies can be made from the fruit, which is gathered in large quantities for this purpose and is sometimes sold in the markets of the towns of western Louisiana, where this tree is most abundant and best known.

We have only briefly mentioned a few of the species which seem best deserving the attention of gardeners, although among the others are several handsome plants which are hardly known to the cultivators of this generation.

The Love of Nature.—III.

WE have endeavored to show that the true love of nature means a broad receptiveness of eye and mind which does not need striking scenery to delight it, but finds beauty and interest in the quietest, simplest scenes, and which does not need constant change to stimulate it, but loves familiar things better and better as they grow more and more familiar. Every one realizes that more kinds of art appeal to its real lover than to the ordinary observer, and that striking spectacular kinds are not exalted by him above all others. All the greatest artists in the world did not paint Sistine ceilings or Venetian triumphs, and some of the world's most famous masterpieces measure only a couple of spans and do not show a single vivid note of color.

So it is with nature and its masterpieces. The finest compositions wrought with mountain-peaks and deep ravines are not really more beautiful or wonderful than those which can be wrought with a gray boulder, a Pine-tree and a carpet of Moss and Ferns; the most splendid panoramic background is not more enchanting than may be a foreground of flowery meadow with a middle distance of woodland, and no background at all except the luminous sky.

Some persons, of course, are born with a true and deep love for nature. But even in them, we think, this love does not develop very early in life. In the majority of cases it seems to have been gradually developed rather than spontaneously felt. And while no one not born with a poet's soul can ever learn to feel Nature's beauties as a Corot or a Wordsworth did, any one can learn to see these beauties, unless his mind is hopelessly sluggish and prosaic.

How, then, can such knowledge be acquired? One way is the landscape-painter's way. The practice of painting, even in the most untrained and amateurish fashion, is, if

sincerely pursued, an excellent help toward the development of a love for nature. If an intelligent young girl would spend an hour a day during a single summer faithfully trying to set down in paint what she sees in nature—now a flower or a branch, now a bit of sunset-sky, a corner of a hedge-row or a little stretch of river-bank—she would find at the end of the season that she had gained new eyes. She would see a thousand things she had never seen before—find beauty in many that before had seemed ugly, and realize the difference between merely “liking” nature and truly appreciating it. It would not matter if all her studies were failures and were torn up in disgust as fast as they were finished. She would have attained a great end, achieved a real success; for she would have enlarged her own powers of enjoyment in a way that would sweeten and dignify all the rest of her life. A vast amount of amateur sketching is done in this country every summer, but we fear it is not often done in the spirit and manner we have indicated. The aim is to produce pretty pictures, not to cultivate the painter’s own intelligence. And while the aim generally remains unattained, intelligence is scarcely increased; for as the excellence of the sketch has been the ruling motive, a subject has most often been chosen because it was easy to do, not because it was exceptionally interesting in itself.

Of course, a thorough scientific acquaintance with natural things need not precede a deep and full enjoyment of them. Indeed, great devotion to scientific study occasionally seems, as in the self-confessed case of Darwin, to kill the æsthetic sense. But this is not because science and a love of beauty are necessarily at variance. It is simply because the powers of the human mind are limited, and intense absorption in one aspect of nature may leave no room in life for constant consideration of another side.

To know the names of plants is often thought by the uninstructed to be the aim and end of botanical study. But a mere acquaintance with these names is not knowledge in the true sense. It is only a necessary step in the gathering of knowledge. Names of plants are important just as names of persons are. We must discover the name of a stranger if we are to identify him, to understand his place in society and the world at large, to remember his individuality, and gain more information about him by speaking of him to others. And so with the name of a plant.

In studying botany we learn first such facts as we naturally know about human beings. We learn what they are, how they live and grow, what is meant by their nearer or more distant degrees of relationship, how and why they are grouped in what may be called families, clans, communities and nations. And as those who have studied them most profoundly have discovered that their relationships depend upon their structure, we must study on these lines to gain any knowledge that is satisfying.

Surprising are the minute and subtle beauties that will reveal themselves when a plant is studied as well as merely contemplated; and surprising are the interesting facts that will reveal themselves when its special place in the plant-world and its relationship to other plants are understood. This enlargement of knowledge deepens interest, and, if æsthetic susceptibility exists at all, greatly widens the scope of enjoyment. To a person who knows nothing of botany, the trees and flowers which he calls familiar are like attractive faces which we meet day after day in the street but cannot call by name and have not the privilege of speaking to. To one who has some knowledge of it, familiar plants are like friends about whom everything is known, and new ones are like attractive strangers with whom we can instantly make acquaintance. The same distinction is true in regard to the larger and more permanent features of a landscape. These features present themselves as one picture to those who know nothing of geological science and quite another and a much more profoundly interesting one to those who have some true idea of the constitution and history of the solid crust of the earth.

The true lover of nature, said William Blake, can “see a world in a grain of sand and heaven in a wild flower.” But such a power of seeing is not given to many persons at their birth. Eyes are of very little use to most of us unless we have learned how to use them. And the best way to learn how to use our eyes is not to cast them about idly, even though we may take pleasure in so doing, but to discover what there is to be seen in the world and then to try to perceive it all. The wise man not only knows nature better than the ignorant man; he also sees it very differently; and in this difference lies a vast unlikeness in the amount of pleasure that is gathered by their eyes. But to be wise in this sense one need not be learned in the scientific sense. One need only devote a fraction of his time to a careful study of the natural sciences so as to have a rudimentary knowledge as a solid basis for the superstructure which imagination can be trusted to rear. Any person who possesses the rudiments of a love for nature, whose soul is naturally open to the influences of beauty, will surely go on, by means of personal observation, to a stage of development where his appreciation of and affection for natural objects will grow with his ever-increasing knowledge of the laws and processes which are the subjects of scientific study.

THE forests of India offer a most instructive object-lesson for Americans. The waste of valuable wood by the axe and by fire was almost as reckless in that country as in our own until the Government began to take measures to protect it. The first efforts did not strike at the root of the trouble, and therefore much time was wasted until Doctor (now Sir Dietrich) Brandis began working in the right direction. The central idea of Sir Dietrich was that the state should manage the forests for the distinct purpose of securing a revenue, and under his administration marked progress was made at once. Our own forests should be preserved for other reasons than merely to insure a lasting timber-supply; but, with the example of India before us, where the forests now yield a revenue of two million of dollars a year, there seems no reason why our own public forests, if properly managed by the Government, should not pay for their protection. It will be a great gain for this country when we learn that forest-lands can be wisely cut over without destroying the forests.

These reflections are suggested by the annual report of the Forest Department of the Madras Presidency for the official year, 1890-91, which contains the usual record of work accomplished in the year. It appears that the area of reserved forest increased 360 square miles during the year, and that the total area of reserved forests and reserved lands in the southern circle amounted to 8,701 square miles. Some of the difficulties which the forest-administration in India has to encounter appear in the fact that it had to bring 3,990 cases of prosecution for trespass and injury to the forest. Most of these were offences for unauthorized felling of wood and for grazing without permission. Conviction was secured in eighty per cent. of the cases prosecuted. Fires, as is always the case in Indian forests, did much damage, one area of 2,700 acres alone having been burnt over. The report states that before the inauguration of the forest-system “it is not too much to assert that the more valuable timbers—that is, the Teak and Rosewood—were being exterminated in all the accessible forest-areas in the southern districts—first, for want of protection, and later on by heavy fellings of all mature trees, without any proper system of care for reproduction and insufficient protection”—a state of affairs which may be seen in every park of North America. The revenue derived from the working of the forests in Madras during the year was the highest on record, and the authorities believe that it will increase largely in the future as the system becomes more fully developed and fairly established.

In the May number of the *American Journal of Science and Arts* Professor William H. Brewer prints an interesting

and sympathetic obituary notice of our late associate, Mr. Sereno Watson, in which, discussing the causes which influenced his career and enabled him to obtain a distinguished position among men of science, Professor Brewer remarks that, "had he died twenty years after graduation, the world would have known little of him, and his classmates would have considered his life a failure. That long period was, however, years of diversified preparation which fitted him to bring to his chosen work most thoroughly trained powers, and gave him a wide range of knowledge drawn from the study of several sciences, and a personal knowledge of the aspects of the flora of many widely separated parts of the country. The reserve which characterized him in college, and which lasted through life, left him all the more free to prosecute his chosen work without the distractions of society. But his reticence was not that of the misanthrope; he endeared himself to all who were brought in close relations with him. This was strikingly shown in the trials and hardships of camp life, as among the inner circles of his friends in the university and in the few families which had the privilege of his acquaintance."

Spring in the New Jersey Pines.

ALMOST all of the flowers in the Pines are tardy in their appearance this spring. A few, however, greeted us as usual despite the cold. Our charming Pyxie (*Pyxidantha barbulata*) was full of bloom early in April, and the Trailing Arbutus was redolent with sweetness at the same time. Although these shy woodland treasures are now past their prime, yet we still find lingering sprays of both, which have been kept in check by the cold.

The Wind Anemone is in flower in damp places. Its pretty blossoms are pinkish purple on the outside, while the inner surface is pure white. In grassy places we find violets innumerable, from deepest blue down to light shades of purple and lilac. All these are varieties of *Viola cucullata*, and they have leaves as varied in form as the flowers are in color. Some have palmate leaves, others broad heart-shaped ones, while many are nearly round. The Arrow-leaved Violet (*V. sagittata*) is also abundant and almost as variable in the form of its leaves as *V. cucullata*, but the color of the flower is a more constant blue in this species. The little white Violets, *V. lanceolata* and *V. blanda*, are here too, giving us a sweet perfume with their delicate beauty. The Bird's-foot Violet (*V. pedata*) is just coming into bloom. This is our finest species. The handsome flowers are large and brilliant, in varying shades of blue and purple, down to the purest white, while some have the petals striped and blotched. The leaves are pretty too, but not quite as handsome as those of the Larkspur-leaved Violet (*V. delphinifolia*) whose habitat is on the western prairies. It is established in my wild garden, however, and flourishes as well as any of its kindred. The leaves are longer and larger and more finely dissected than those of *V. pedata*, and the clumps of foliage are pretty all summer. The flowers are deep blue and do not vary in color, and are small compared with the Bird's-foot Violet. Of the leafy stemmed violets, I have found only *V. canina* in the Pines, unless we can establish the fact that *V. tricolor* is indigenous. This species I have seen in old neglected fields, but never where the ground had not at some time been cultivated.

The little heath-like *Hudsonia tomentosa* is beginning to light up the gray sandy places with its bright yellow flowers. Before it blossoms, its downy, sharp-pointed, grayish leaves so blend with the sand that it is scarcely discernible a few feet distant, but during May it makes the waste places gay with color. *Helonias bullata* is very late coming into flower this spring. For twenty years or more I have not failed to find it in blossom in April, and now it is only in bud with the flower-scape only five or six inches in height. But the Golden-club (*Orontium aquaticum*) was not to be kept back by the cold. It was in flower by the middle of April, but the leaves were seared by frost while the flowers were not hurt at all. The leaves of this plant when perfect are very handsome; they are large and present a deep green, rich, velvety upper surface that sheds water, while the under surface is very smooth and of a light color, and always wet or moist. *Arnica nudicaulis* is in flower, each stalk surmounted with several heads of deep orange flowers—very pretty and attractive; and the modest little plantain-leaved Everlasting was in bloom early in April, and still continues to flower in dense patches along the road-

sides and in the barrens in company with its more showy neighbor the Arnica.

The false Dandelion (*Pyrrhopappus Carolinianus*) is growing here on the roadsides and in the fields. I noticed it for the first time three or four years ago. It is supposed to be a more southern plant, but it seems to be perfectly at home here. Its bright yellow flowers are quite pretty on a branching stem—solitary on each branch. The stem is a foot or more in height. *Potentilla Canadensis* was blooming in April, and its variety, *simplex*, is just coming into flower. Are not these two plants dissimilar enough to be classed as distinct species? *P. Canadensis* always creeps, while its so-called variety is erect and stout, with more vivid green leaves than those of the type. The flowers in both are similar, and this is the only justification for considering one a variety of the other.

Only a few flowering shrubs are in bloom as yet. *Cassandra calyculata* has been very full of blossoms, but is on the wane now. *Leucothoe racemosa* is in flower, and *Amelanchier Canadensis*, with its many varieties, is everywhere in the damp barrens. Some have pure white flowers, and others pink and rosy like Apple-blossoms. The red fruit of the swamp Maple is strung thickly along the branchlets, and is very showy and handsome, and the yellow flowers of the Sassafras make a lovely combination of color. The red berries of last year still cling to the Hollies and to *Ilex verticillata*, while beneath our feet are the spicy Wintergreen berries and the paler red of the Partridge berries. The shining black fruit of the Inkberry (*Ilex glabra*) is abundant, and also clusters of the purplish black fruit of *Smilax*. *Negundo*, with its delicate drooping clusters of flowers, is handsome now, and blossoms of Sweet-gum still linger as well as those of the Tupelo.

Vineland, N. J.

Mary Treat.

Plant Notes.

Some Recent Portraits.

IN the April number of the *Botanical Magazine* are figures of *Lilium primulinum* (t. 7227), a plant recently imported by Messrs. Hugh Low & Co. from the Shan states in Upper Burma. Its nearest allies are *L. Nepalense* and *L. Neilgherrense*. It produces a stiff erect glabrous stem three or four feet tall, with scattered lanceolate, sessile glossy bright green leaves three or four inches long, and about three flowers arranged in a corymb or umbel on long-nodding pedicels, each with a large lanceolate leaf at the middle. The perianth is open, funnel-shaped, pale yellow without spots, and tinted on the outer surface with green while young, and is five or six inches long; *Habenaria longecalcarata* (t. 7226), one of the long-spurred species of India, characterized by the large flowers and the great length of its spurs; *Cirrhopetalum ornatissimum* (t. 7229), a native of Assam and the eastern Himalayas, a plant which much resembles *C. Collettii*, previously figured in the magazine (t. 7198), although differing from that species in the form of the pseudo-bulbs and in the erect scape springing from the side of the pseudo-bulb, and not pendulous and developed from the young growths before the new pseudo-bulbs are formed, as is the case with the second species. It is rather as botanical curiosities than as ornaments of the garden that these plants will be cultivated. *Streptocarpus Galpini* (t. 7230), already described in our columns; *Beaufortia sparsa* (t. 7231), a brilliantly flowered shrub with a curious inflorescence, which presents the appearance of a spike the axis of which is produced above into leafy branches, but which in reality is the result of a consecutive series of closely contiguous leaves being reduced to bracts and producing each in its axil a flower, the whole being hidden by the bundles of pendulous stamens. In *B. sparsa* there are about five of these bundles in each flower, each bundle consisting of a thread about an inch long bearing about eight long-stalked diverging filaments, of which two are opposite and placed considerably below the five that terminate the thread. *B. sparsa* was discovered late in the last century by Archibald Menzies, the surgeon and naturalist of Vancouver in his voyage of discovery, on the shores of King George's Sound, in south-western Australia, where the town of Albany now stands, a locality well known for its rare and beautiful



Fig. 40.—The White Thorn (*Crataegus mollis*) in New England.—See page 217.

plants, and known as the only habitat of the Australian insectivorous plant, *Cephalotus follicularis*. It has been known in cultivation for half a century, although, like many other plants of its class, it is now much less frequently seen in gardens than it deserves.

Foreign Correspondence.

London Letter.

NEW CATTLEYAS.—On March 4th last Messrs. F. Sander & Co. offered for sale a *Cattleya* which they had named *C. Victoria Regina*, and described in the sale catalogue as a new species, with flowers five inches across and as many as eight or nine on each spike. Their color was said to be glossy deep rosy red, with blotches of crimson and purple, paler on the margins, which were wavy; the lip crimson, with a white tube. The pseudo-bulbs, foliage and general appearance of the plants in the sale-rooms strongly suggested *C. amethystoglossa*, now called a variety of *C. guttata*, but Messrs. Sander & Co. say there are good differences between their new one and any of the known forms of *C. guttata*, and, also, that the plant is found wild in a locality far removed from that where *C. amethystoglossa* comes from. The plants have not yet flowered, but, judging by a specimen in the Kew collection, they ought to prove easy to manage. A considerable number of plants were sold at the sale. This week the Messrs. Linden, of Brussels, advertise the sale of another new *Cattleya* for April 29th, which they have called *C. Alexandræ*. A description of the plant by Mr. Rolfe is published in this week's *Gardeners' Chronicle*, from which it would seem that this also is a near ally of *C. amethystoglossa*, pseudo-bulbs and leaves resembling that plant very closely. Its most remarkable character, however, is the length of the peduncle or flower-stalk, which is from fifteen to eighteen inches long and bears from six to ten flowers. The color of the flowers is described as being similar to those of *Lælia grandis tenebrosa*. I shall not be surprised if, when this and Messrs. Sander & Co.'s plant flower, they prove to be one and the same.

CYPRIPEDIUM EXUL.—This plant was described in the *Gardeners' Chronicle* last year by Mr. H. Ridley, Director of the Botanical Department in the Straits Settlements, from specimens collected in Assam. It was, he said, a very distinct variety, both in form and coloring, of *C. insigne*. Plants of it were sent to England, and one of them was exhibited in flower last Tuesday by Mr. R. I. Measures. This differed so markedly from what we know as *C. insigne* that it was considered expedient to elevate the plant to the rank of a species, which has been accordingly done by Mr. O'Brien, whose description, with a drawing of the flower, has been published in the last *Gardeners' Chronicle*. Mr. O'Brien points out the resemblance in the leaves and form of the flowers of *C. Exul* to *C. Druryi*, which, however, has yellow flowers, while those of *C. Exul* are colored like *C. insigne*, var. *Maulei*. The plant was imported in large quantities into England in 1891 and sold as the Siam form of *C. insigne*. It is distinct, but not attractive in color, and is not likely to become a favorite except, perhaps, with those who have the *Cypripedium* mania.

ODONTOGLOSSUM WENDLANDIANUM.—This is a new Sanderian introduction, of which a plant in flower received a first-class certificate from the Royal Horticultural Society on Tuesday last. It is in the way of *O. niveum* or *O. blandum*, some suggesting that it is a cross between the latter and *O. Andersonianum*. The sepals and petals are narrow, elegant, creamy white with chestnut blotches, the lip white spotted with rose-purple. It is a pretty little Orchid, quite equal to the best forms of *O. blandum*.

CATTLEYA BURBERRYANA, a cross between *C. intricata* and *C. superba*, received an award of merit, as also did a hybrid *Cattleya* from Messrs. J. Veitch & Sons, named *C. Philo*, a hybrid between *C. iricolor* and *C. Mossiæ*.

RHODODENDRON RACEMOSUM.—An exhibit of more than ordinary interest at the last meeting of the Royal Horticultural Society was a basket filled with plants in flower of a charming little *Rhododendron* with the name at the head of this paragraph. The plants did not exceed six inches in height, and they were not unlike ordinary Box in habit and foliage. The flowers, which were arranged in loose heads four inches across, were three-fourths of an inch across, shallowly campanulate, colored pale rose, with a deeper margin. They were slightly fragrant and altogether delightful little bouquets. The plants were from the Coombe Wood nurseries of Messrs. J. Veitch & Sons, where they had been growing in the open ground all winter, and had been lifted only a few days before they were shown in flower. From this it would appear that this tiny *Rhododendron* is hardy near London, and a most promising little plant for the garden. The name, however, may possibly be wrong. *R. racemosum* was described by Franchet from specimens collected by Delavay in Yun-nan. There is a type specimen of it in the Kew herbarium, and this differs in several important points from the plant called *R. racemosum* by Veitch, the scales on the stem being different, the flowers smaller, the pedicels shorter and the leaves larger and thicker than those of the plants shown in flower. Furthermore, there are specimens at Kew of *R. parvifolium* which agree very well with Messrs. Veitch's plant, and which are of Chinese origin. But we have also in cultivation a plant called *R. parvifolium* which is poor in comparison with Messrs. Veitch's new introduction; in fact, is scarcely worth a place in the garden. *R. parvifolium* is, however, found in Siberia as well as in China, and it may vary considerably, as do many of the *Rhododendrons*. We have at Kew a plant called *R. racemosum* which was certainly raised from seeds collected by Delavay, and this looks like that of Messrs. Veitch. But, whatever its name may be, Messrs. Veitch & Sons are to be congratulated on having a new *Rhododendron* distinct in character, pretty, and full of promise as a hardy plant. This is the second to flower in England of the new Chinese *Rhododendrons*. Of course, it obtained a first-class certificate.

HYACINTHS.—The monopoly of the bulb trade by the Dutch is probably due to cheap labor as well as to the natural advantages which the peculiar character of the soil and lowness of the country afford. Custom, too, has, no doubt, much to do with it. We buy bulbs from Holland for the same reason as we buy knives from Sheffield. But first-rate bulbs, equal to the best Dutch, can be grown in England. We know this with respect to Daffodils and Tulips, and we may now add Hyacinths. For the last five years Kew has made the experiment of raising Hyacinths from bulbils, growing them on in nursery-beds, lifting them and storing them in a dry shed for the winter and removing the flower-spikes as soon as they open until the bulbs are full size, when they are planted in the flower-beds for spring effect. At the present time the whole of the large geometrical flower-garden in front of the great Palm-house is filled with about 10,000 Hyacinths, all in full blow, every one of which has been raised at Kew in from three to five years from bulbils. Samples of the spikes were exhibited before the Royal Horticultural Society last Tuesday, and they were generally admitted to be equal to those of Dutch origin. Of course, I do not mean by this to suggest anything beyond the fact that many people might find pleasure and satisfaction in growing for themselves bulbs which are now purchased annually and thrown away after they have flowered. From the commercial standpoint I question if it would ever be possible to produce in England bulbs equal to those grown in Holland, and at the same time as cheap.

AUSTRALIAN PLANTS.—The greenhouses at Kew owe not a little of their charm at this time of year (April) to the various Australian hard-wooded plants, so called, which have received special attention at Kew during the last few years. The most noteworthy are the Acacias, to which I

have previously referred, the Chorizemas, Pimelias, especially *P. Nieppergiana* and *P. spectabilis*, the latter a charming pot-plant, with many branches, every one terminated by a head of creamy white flowers as large as a crown-piece. *Pultenœa flexilis* is a bush, eight feet high and as many across, with branches most elegant and graceful, the whole so thickly studded with bright yellow pea-like flowers as to suggest a cloud. This is planted out in a peat-bed, and I know of no shrub, indoors or out, that surpasses it. Close to it is a large bush of the allied *Eutaxia myrtifolia* and another of *Aotus gracillima*, whose long wand-like branches, clothed with yellow and brown flowers, are a delightful feature. The white orange-like flowers of the various *Eriostemons*, the elegant, brightly colored *Epacris*, and the white star-like flowers of the graceful *Leptospermums*, with the rosy bells of *Baucria rubioides*, are all such as arrest attention and win general admiration. The brilliant *Boronia heterophylla*, grandest of all *Boronias*, is now worth going a long way to see. These, and many others which one might mention, are first-rate garden-plants when well grown, far more attractive in every way than hosts of the things which are in general favor.

Peat, plenty of sunshine and air, with the exclusion of cold and damp in winter, are the principal factors in the production of good specimens of hard-wooded plants for the greenhouse, such as those mentioned above.

London.

W. Watson.

Cultural Department.

The Cultivation of Ginseng.

THERE was a touch of pathos in a remark I heard from a farmer's wife while rambling over the hills of Cortland County, New York, in quest of Ginseng. "It is a shame," said she, "that Ginseng is so hunted and stolen from our forests that we can hardly find a root for our own use." From Minnesota to Carolina the gathering has been carried on until in the places where this beautiful plant was once so abundant that one could hardly step without treading on it, only single roots can now be found. It is only a question of time when Ginseng, at the present rate of destruction, will be utterly exterminated from our forests. Last year more of the root was exported to China from this country by 80,000 pounds than was ever sent before in any single year, and notwithstanding the growing scarcity there are ten persons hunting for the roots now where there was one ten years ago. From early spring to late fall the Ginseng-hunter toils with his bag and spud through tangles of brush and brier, his day's labor often rewarded with only a few ounces of roots, while a more fortunate chance may give him as many pounds some other day. The hunt has been greatly stimulated by recent high prices, and there is, too, a fascination about the quest which is only known to those who engage in it.

Ginseng is one of the most beautiful plants found in our forest. Its form is symmetrical, its foliage is delicate and its seed-head is beautiful. It is often described as a fifteen-leaved plant, but it has really from three to twenty-five leaves, according to its age and vigor. In central and northern New York it comes out of the ground about the first of May. The leaves attain their full size in June. The blossoms appear about the first of July, and are very small and delicate, and under a magnifying-glass beautiful. The berries develop rapidly, and are light green until the 20th of August, when they commence to color; in September they are bright scarlet and make a very showy appearance. A large, vigorous, twenty-leaved plant may have as many as thirty or forty berries in a round compact ball on a slender stem from four to six inches in length, each berry containing from one to three hard rough seeds. The berries are round and elongated or triangular in shape, according to the number of seeds, and they are often as large as a small bean, and are meaty and pleasant to the taste. They fall to the ground soon after ripening and are covered by the falling leaves. But since one covering of leaves would not suffice to protect the delicate root as it first pushes from the seed, nature provides that the germ in the little seed shall patiently rest until another year has spread another covering of leaves over it. Then, after the snows of a second winter have rested upon the seeds and firmly imbedded them in their position, they

awake from their sleep of eighteen months and send up a small plantlet about two inches high, with three leaves, and a root not larger the first season than a grain of wheat.

The plant grows slowly and attains a great age. Roots, thirty or even fifty years old, often weigh less than one ounce, and again they have been found weighing three and even six or eight ounces, though not nearly as old. How do we know the age? By the notches on the neck of the root. The plant keeps its own record, each year's growth adding to the length of the neck and leaving a notch where the stalk falls off. As the roots increase in age they assume strange and fantastic forms, so that it requires but little imagination to see the form of the human body in many of them.

Ginseng also grows in China. In his *Middle Kingdom* Williams says, "It is found wild in the forests of Manchuria, where it is collected by detachments of soldiers detailed for the purpose. These regions are regarded as imperial preserves, and the medicine is held as a Government monopoly. The importation of the American root does not interfere elsewhere with the imperial sales, as the Chinese are fully convinced that their plants are superior." The root has been exported to China from this country for more than a hundred years. At first it was bought of the Indians at \$2.00 a bushel for green roots. Within the last few years local dealers have paid as high as \$1.15 for a pound of green roots, while the dry root has sold as high as \$4.25 in New York. But for the foreign demand it would not be worth more than five cents a pound here, and our forests would soon be filled with the plant. It is sometimes sold for its weight in gold in China, and at other times for its weight in silver, according to its supply and demand. A single root having the form of the human body may bring from \$2.00 to \$4.00. In the *Oil, Paint and Drug Reporter* for May, 1889, it is said: "An example of the cost of this medicinal root is afforded by a recent *Pekin Gazette*, which contains a report from the Military Governor of Kirin, stating that he has forwarded by special messenger for the Emperor's use eight large and sixteen small roots weighing together nine and four-tenths ounces. The total cost is given as 1,560 taels, or about £400, being at the rate of £45 an ounce." The Chinese do not base their estimate of its value upon chemical analysis of the root, but they reason that a root which attains such extreme age and so resembles the human form must possess supernatural power, and that therefore it is capable of imparting its virtue to the human body; hence if they eat such roots they will ward off disease and prolong their lives to extreme old age.

It is the general opinion in this country that the plant cannot be successfully cultivated. In 1891, while attending the State Fair with an exhibit of Ginseng, I was told by more than a hundred people that they had tried to cultivate the plant by setting roots and sowing the seed, but that it never grew. And this was my own experience at first. My first sowing of seed did not produce a plant. Two hundred roots which I put into the ground in 1886 made little growth the first year, and the outlook was so unfavorable that I abandoned the business. In 1887 I put in some roots and sowed some seeds, and the next year my plants made a better showing. I then commenced to study the habits and characteristics of the plant, and, with the experience gained, my success has been complete. I had thousands of fine plants growing on my ground in 1891. Many roots can be grown in a small space, and although the growth on each one during the season is small, yet the aggregate is considerable. The plant will grow much more rapidly under cultivation than it will wild, and it therefore seems destined to become an important agricultural product. The seed alone will pay for the expense of cultivation, and there will soon be a demand for all there can be produced. The Legislature of Ontario, by its recent action in passing the law to prohibit the digging of roots between the 1st of January and the 1st of September, has taken a step in the right direction, and it would be well if our state legislatures would pass similar acts for the protection of the wild plants in this country.

There is a general impression that our Ginseng may be grown in the forest, but that it cannot be successfully cultivated in the open garden or field. Of course the forest is the natural home, and when it is once established in the woods it will require but little care or attention. The only danger would be in protecting the crop. Ginseng, along with other medicinal roots growing wild, is by common consent regarded as free plunder, and the average Ginseng-hunter would hardly have so fine a sense of honor as to discriminate between the wild and cultivated plants. In the forest any light soil will answer, so long as it is not wet or swampy. All that is necessary is to place the seeds or roots in the ground, and nature will do the rest if time is given. My own operations have

been in the open garden. Small roots may be set three inches each way, and seed may be started much closer and transplanted in two or three years. Experience will show the best method of shading. I have found that shade of some kind is essential. All that is needed, then, is weeding and careful cultivation. From an area measuring forty-feet in length by three feet in width I lately took 570 roots, weighing 18 lbs. 14 oz.; 343 of these were small, and weighed together 5 lbs. 7 oz., which I reset. The remainder weighed, when dried for market, 4 lbs. 12 oz., for which I received \$16.83, besides fifteen ounces of seed, for which I have a ready sale at \$1.00 an ounce. Of course there is much to be learned as to the best methods of planting and cultivation, but the cultivated root is firmer and shrinks less in drying than the wild article. In my opinion the growing of the plant can be made profitable, even if the root does not bring more than \$2.00 a pound.

Summit Station, N. Y.

G. Stanton.

flicted in a similar manner and recently studied. To cure such leaves seems out of the question, and what to do as a preventive is not easy to suggest. Some one with a fondness for life-histories of nematodes might well devote much time to the answering of many practical questions concerning these foliar eel-worms.

Rutgers College.

Byron D. Halsted.

Euphorbia Jacquinæflora.

THIS plant, a very old inhabitant of our greenhouses, is more correctly known as *E. fulgens*, but to the present generation of gardeners it will be the more familiar by the old name. Like *E. pulcherrima*, which is also better known as *Poinsettia*, it is a native of Mexico, and both are naturalized in Florida in the Orange belt, and make a gorgeous display at Christmas-time out-of-doors. It is well known that it is the colored bracts of the *Poinsettia* which make it so conspicuous, but in its near relative it is the flowers themselves that are ornamental. These are produced in short axillary racemes at the extremities of the shoots, and the quantity of flowers depends entirely on the strength of the shoots. For this reason we prefer to grow the plants on quickly to a single stem, not pinching the tops out at all, as one good stout spray twelve to eighteen inches in length studded with bright orange-scarlet flowers is much preferable for cutting purposes to smaller sprays, even if more numerous. Under pot-culture, *E. Jacquinæflora* has a rather bad reputation, it being somewhat liable to die off just above the soil. Too much or too little water will produce this result, but we find that when planted out in benches in an ordinary Rose-house temperature a vigorous healthy growth can be obtained, with very little danger from the trouble referred to, with an abundance of bloom at a season when cut flowers are in great demand. Another feature of this plant is, that the flowers will be produced on the plants in succession for more than two months, so that there is no trouble in saving them for any special purpose or occasion. It is well known that *Poinsettias* wilt badly when cut and put in water, but if cut and the whole stems submerged in water, and the bracts allowed to float for about twenty-four hours, this difficulty may be entirely overcome, and the same treatment can be given to the *Euphorbia*. This was discovered quite by accident, when a lot of wilted branches of *Poinsettias* were placed in a bath-tub to preserve the bracts; the stems are capable of absorbing a quantity of water and storing it for use. We find *Euphorbias* root easily when the young shoots are taken off close to the old stems, or "with a heel," as it is termed by propagators. These are potted up when rooted, and grown on into four-inch pots, and from these transferred to their permanent places in benches wherever there is root-room. The growth made is somewhat slender, and does not shade or otherwise interfere with other occupants of the house or benches, and the temperature and soil of a Rose-house suit them admirably.

South Lancaster, Mass.

O. O.



Fig. 41.—Leaf attacked by Nematodes.

Foliar Nematodes.

THE most striking instance of eel-worms destroying the leaves of plants which has come to my notice was seen on specimens of *Ficus comosa*. When first observed nearly all the leaves were badly blotched, and several of the lower ones had fallen away. Upon the upper side the leaves have a bronzed appearance, while the lower side is brown and somewhat rusty in color. As has been heretofore observed in *Coleus* and *Salvia*, the nematodes do not destroy the life of the leaf-pulp uniformly, but, instead, ruin it in spots that are decidedly angular in outline, the boundaries corresponding to the veins of the leaf. In the worst cases the whole leaf may become brown and dead. The engraving illustrates the appearance of a leaf that is attacked to only a moderate degree, and was selected for the photographs on this account. It will be noticed that the diseased area is the central portion of the leaf, and its position leads one to wonder if the worms may not have come up from the soil or roots through the stem and leaf-stalk. This seems to be the case with young Ferns af-

Notes on Species of Tulips.

DURING the last twenty years many species of Tulips have been re-introduced into cultivation, principally through the exertions of Dr. Regel, of St. Petersburg; they are interesting, and vary in the form and color of the flowers, and some are quite new in gardens. *Tulipa Batalini* produces exquisitely shaped flowers, straw-colored in one form and deep scarlet in another; the flowers are of medium size, but beautifully proportioned. *T. Korolkowi marginata* is an early-flowering species, with small but well-shaped, brilliantly colored flowers, the segments deep scarlet and margined by a broad band of brilliant yellow. *T. Kaufmani* is one of the earliest-blooming species, or perhaps the earliest. There are two forms: one with flowers straw-colored inside and rose or purple outside, and the other with flowers golden yellow, blotched with bright scarlet. Bright red outside and straw-colored within are the flowers of *T. Leichtlini*, introduced by myself from Cashmere. This is a rather dwarf, small-

flowered species, but is attractive. *T. Greigii*, a species with large, bold, brilliantly colored flowers, is already well known. The largest-flowering Tulip I know is *T. oculis solis*, var. *mervensis*, a peculiarly stately plant, with scarlet flowers blotched with black. *T. Turkistanica* is a curiosity, producing sometimes as many as nine flowers on a single scape; they are white and yellow within and mauve without. *T. Alberti*, *T. lanata*, *T. Kesselringii*, and *T. Eichleri* are well worth cultivation. In mediæval times many of these Tulips were brought to Constantinople to the Caliph's garden, and from there were sent to Holland, where they were used in the production of garden hybrids and ultimately lost in their original forms.

It is evident that the next ten years will give us more new and beautiful type forms of Tulips than the last twenty-five years have done, as importations of plants from Armenia and Persia are now far in excess of anything known before; and a vast field is now open for the systematic crossing of the different species, or of the species with the best forms of garden Tulips. According to my experience with these plants, the female parent gives the form to the offspring.

Baden-Baden.

Max Leichtlin.

Seasonable Work.

THE plant-grower at this season is burdened with pressing work of many kinds. The plants intended for bedding out will naturally be among the first to be attended to, for most of them will be required during the next two or three weeks (at least in this latitude), and to prevent any check in growth after they are planted out they should be properly hardened off by abundant ventilation if they are kept in the greenhouse. The better plan is to place them in a cold frame, if such a convenience is at hand. With tender kinds, such as *Coleus*, *Alternantheras*, *Acalyphas*, *Crotons*, *Musas* and other plants of succulent growth, nothing is gained by very early planting, for the check thus given frequently results in permanent injury, and to avoid this it is wiser to keep such plants where they can be protected until the third week of May or even the first of June in exposed locations in the middle states.

The many good qualities of *Crotons* and *Acalyphas* as bedding-plants should not be forgotten, for the rich effects produced by them cannot be easily surpassed by any others. Tuberous *Begonias*, too, ought to be largely used, and in appropriate locations they will prove among the most showy of outdoor flowering plants. These should be grown into sturdy specimens before being planted out, for though the tubers may be planted while dormant and prove successful in some cases, yet a more even bed will be secured by the use of well-established plants; and the season of flowering will then extend from the time of planting out until frost comes in the fall.

In the greenhouse, also, there are many things to be provided in order to keep up a constant display. For instance, the *Gloxinias*, *Gesneras*, *Achimenes* and *Tydeas* are all valuable for summer decoration of a conservatory, and will all need liberal treatment now, such as sufficient pot-room, good drainage, a fresh light soil, enriched with liberal supplies of thoroughly rotted cow-manure.

All plants of this character should have plenty of room for the best development of their foliage; the *Gloxinias* especially need this precaution, and as the leaves frequently become a foot or more in length under good cultivation, the plants may need lifting up on an inverted pot to keep the foliage clear of the bench. Some of the Tuberous *Begonias* are excellent pot-plants for conservatory decoration, among these being *B. Boliviensis*, *B. Sutherlandii*, *B. Chelsonii* and *B. Froebelii*, all of which are worthy of more attention, and they should now be nicely started.

Caladiums also should now be started, and as soon as they become established will require an abundance of moisture both at the root and in the atmosphere to develop their finest foliage, and when the pots become well filled with roots a top-dressing of manure and also watering with liquid fertilizer will be beneficial, for *Caladiums* are gross feeders, and can assimilate large quantities of stimulating food. The *Alocasias* should now be in active growth, and, like all of the *Arum* family, enjoy plenty of moisture when in that condition. Light potting is best for these plants, and especially for the tenderer species, like *A. Sanderiana*, *A. intermedia*, *A. Sedenii* and others, and in all cases thorough drainage is essential. Seedling *Cyclamens* for next winter's flowering should now be ready for a shift from the small pots in which they have been potted off into those of three or four inch size, and these plants also should not have the soil pressed too hard into the pots, and should have a light open compost in which may be in-

cluded some pulverized brick. An airy location, with plenty of light, is necessary to insure a sturdy growth of good foliage on *Cyclamen Persicum*, and when such growth is secured there is seldom any difficulty in getting a good crop of flowers.

Pot *Chrysanthemums* for next fall will also need attention now, a steady growth being most desirable, and an essential point in securing this is to avoid all extremes in watering.

Holmesburg, Pa.

W. H. Taplin.

How Some Half-hardy Shrubs Survived the Winter.

NO winter, however mild or cold, passes without leaving some marked effects on the arborescent vegetation, some of which are often least expected. It is never safe to predict just in what condition any of our half-hardy trees or shrubs will come through a particular winter, because the injuries are not proportionate with the degrees of temperature registered by the thermometer. The condition of the plant when the period of rest begins in the autumn is a powerful factor in determining how much vitality there will remain in the spring, and usually sudden opposite changes in temperature are more injurious than extreme weather if uniformly cold. The past winter was, on the whole, probably a little colder than the two preceding in the vicinity of Boston. But at no time did the temperature fall much below zero of Fahrenheit, and although the ground was bare a large part of the time, there was more snow than in either of the previous seasons.

A look now over the collections of shrubs here plainly shows to what extent any of them sustained injury. *Rhododendrons* and *Azaleas* have wintered remarkably well, and very few buds show signs of injury. Even such uncertain species as *R. Dauricum* and *R. mucronulatum*, notable for their extremely early flowers, have blossomed better than usual. *Daphne Cneorum*, with the slight protection of leaves which it usually requires, appears in fine condition, although no doubt there are exposures where it has suffered. Plants of *D. Mezereum* covered with soil, and others beside them left quite unprotected, showed that there was little or no advantage this season in covering, for the unprotected plants are in quite as fine condition as the others, although the flower-buds may have been more injured by spring frosts because they developed earlier.

A Japanese *Ilex*, *I. Sieboldi*, also came through the winter in better condition by being left uncovered than closely adjoining plants of the same species which were carefully bent over and covered with soil. Some of the tips of the protected plants have an unhealthy appearance or are dead, and appear as though they had heated in the soil, whereas the unprotected plants are perfectly sound and healthy to the last bud.

The pretty-flowered *Corylopsis pauciflora*, from Japan, may be found hardy in some situations about Boston, but as it is placed in the Arboretum it does not generally survive the winters well without some sort of shelter. It forms a slender many-stemmed bushy shrub. Last autumn one-half of the stems of the plant were bent downward and covered with soil, the other half left exposed. As a result the half of the plant which was protected is now (May 4th) well laden with a profusion of its beautiful straw-colored flowers, while the ends of the shoots of the unprotected portion are nearly all dead, a large proportion of the buds are destroyed, and only a very few straggling blossoms have developed, chiefly on the lower portions of the stems.

Ribes sanguineum is another pretty plant whose branches, in this latitude, it is well to cover if good blooms are desired. Repeated experiments, similar to that with the *Corylopsis*, have shown the need and advantage of protection, and as the stems bear bending very well it is an easy matter to peg them down and cover with soil. By treating *Gordonia Altamaha* in the same way we are able, late in the autumn, to get some of the beautiful white single *Camellia*-like flowers from this southern plant.

Stephanandra flexuosa, not long since introduced from Japan, did not give promise of much hardiness when first planted in the Arboretum, but it is now well established, is about six feet high, and its buds on most of the stems appear fresh and living almost to the tips. The plant had no protection whatever during the winter.

Repeated attempts prove that, as a rule, there is not much satisfaction to be had in attempting to grow the different forms of *Hydrangea hortensis* in the open air here, if the object is to raise the flowers. In spite of heavy coverings the stems annually die to such an extent that no blossoms are produced.

The different common species and forms of *Tamarix* have come through the winter in first-rate order. Very often the ends of the branches are destroyed. The European "Gorse"

(*Ulex Europæus*) and Broom (*Cytisus scoparius*) suffered in spite of heavy covering. Neither of them is reliably hardy in this latitude and climate, although they thrive in the extreme south-eastern part of Massachusetts.

The Heaths, too (*Erica* and *Calluna*), do not always come through the winters unscathed, and even when afforded some covering a portion of the branches of *Calluna vulgaris* will sometimes turn brown. This observation is made of plants in cultivation; perhaps in thoroughly congenial situations of soil and moisture they would make a better showing. But even with a partial loss of stems, enough usually remains to produce a good show of flowers to encourage the cultivator.

Arnold Arboretum.

J. G. Jack.

Correspondence.

Spring in Boston—A Foreigner's Impressions.

To the Editor of GARDEN AND FOREST:

Sir,—Spring came with a burst to Boston this year, as it has done a good many years, I fancy, only I have not been there to notice it. It was all new to me, and the perpetual changes in the weather were in themselves a never-failing source of interest. Watching these changes and wondering what might come next was like studying the moods of a wayward and delightful woman, whose occasional sullenness was more than compensated for by the brilliancy of her smiles, when that humor seized her, or by her impulses of stimulating breeziness. I kept a weather-journal for a while, but it took too much time even if I had been able to remember all the changes that took place when I was away from my note-book for a few hours. All of a sudden, just as I was beginning to tire of my charmer, the sovereign change came; spring was here and obliterated the very memory of all that had gone before. Spring came, with warm soft breezes that irresistibly suggested visions of southern climes, and yet helped the sunshine to fill the heart with contentment. Spring came, and with it the joy of the first sparkle of living green on the lawns of the Public Garden, the first Crocuses in sheltered places along Beacon Street. Now the whole procession of spring flowers would be coming to light up the town gardens after the long gloom of winter.

Spring in town has a beauty of its own. It may not be comparable with that of spring in the country, for all the costly bulbs that ever came from Holland cannot produce flowers which give the pure joy of the sweet English Violets, or the small star-like Anemones that spread a delicate purplish blue carpet over sunny slopes in our Swedish woods, or of the gorgeous Italian Anemones, handsome, frank and pure as a Tuscan mountain-girl. But spring in town has a beauty of its own akin to the bright beauty of the treeless south, and duly felt by the Neapolitans, among whom some of the lost Italian color-sense still lingers when they deck their fruit-stalls and fish-venders' carts with flowers in the bright colors and harmonious combinations that the glorious sunshine calls for. The call is almost as strong here in New England, and just as strong out of town as in it—witness the intense green of the Flags and the joyous note of accordance with Nature that they strike. Only in the country there are also the woods, with their broken interlaced shadows and drifted heaps of fawn-colored leaves, their expectant quietness and cold suggestive corners. In town we have nothing but unmitigated sunlight, intensified by reflection from long lines of brick walls, sharply defined house-shadow, spring dresses, bright sunshades, gay colors in shop-windows, and glittering expanses of emerald grass in plots and squares and public gardens. I do not say that there is not room for the still small voice of Violets and shady cool corners in town, too; but on the whole I think the special spring beauty of town gardens, as of fields, is mainly to be sought in brilliancy. Fortunately, Nature has provided for this, and given the artist-gardener a working palette of the most splendid colors—colors which in summer would perhaps seem garish to some tastes, but which in spring, after the long starvation of the winter, only seem to satisfy a natural craving of the eye, and afford invaluable opportunities for the education of the color-sense. Everything is educational nowadays, and such public functionaries as curators of museums and superintendents of public gardens are not always to be envied. While the democratic principle demands that they should make their collections or gardens useful for practical study by the people who pay for them, socialistic thought has progressed far enough to demand that they should feel their responsibility as educators of the masses. Now, if there is anything that needs re-educating up to a lost standard, it is the color-sense in the great mass of people to-day, and the spring

flowers offer splendid opportunities in this respect, both for strong masses and bands and splashes of pure color, represented by the Tulips, and for soft and delicate harmonies of tint and tone, furnished by the Hyacinths, so like soft uncut velvet in their first fresh texture. I have often thought that it would be well to let a French milliner with real taste be consulted about the arrangement of flower-beds, especially of Hyacinth-beds. Would that the Boston public gardener had called in a certain French milliner in Boylston Street for advice as to color-combinations! And why not? What is good in a bonnet is good in a flower-bed, and a flower-bed is a vastly more important thing than a bonnet.

My ardor of hope was a little damped when I saw that the Crocuses had been put into the lawns at regular intervals, making tedious diagonal and cross lines over the grass like the designs of certain wall-papers. Well, that was a mistake perhaps. I still ventured to hope for great things from the Tulips and Hyacinths, and made a special pilgrimage into town (I was in the country by that time) to see them.

Boston readers will appreciate my disappointment at the sight I saw. For readers out of Boston I will add that the bulbs seemed put in the ground haphazard, and that the only care exercised had been to get in as many as possible. As to color-schemes, harmonies, combinations, they were non-existent, or, at least, incomprehensible. No wonder that the ladies prefer to go to Madame O.'s plate-glass windows for their coloristic education. There was nothing educational in the bulb-beds of the Public Garden. They showed a jumble so characterless, so confused, that I could not even stop to notice the infelicitous combinations, as a warning against ever trying them again. I simply hurried on in sorrow, and now can only remember a profusion of pale mauve Hyacinths just where they ought not to be, dominating the patternless mosaic of other tints in a way that made them seem almost vulgar.

After my first impressions were in type I went into town for a second look, so that I might see the full glory of the Tulips. The Tulips were better, and some of the combinations were excellent, such as a blaze of red set off by a band of white or a field of pink, framed in a deeper rose. Some little arrangements were almost as attractive as if the French milliner's dainty taste had been consulted, as, for example, little round plots of golden white Tulips set on dark Pansies. But there were exceptions. The artist, as a rule, seems to have been controlled by the notion that a mass of Tulips in one tint or shade, set off by a border of Tulips in another and planted in a thick bed of Pansies of any color, could not help being beautiful. In some cases the result was happy, although even the little plot of white Tulips and Pansies I have mentioned would have been more effective if the Pansies had been allowed to broaden out into a border, so as to make a setting of a deep velvety tone around the bright centre of the Tulips. In other cases the result was painful—a combination of two discordant reds, for instance, or a good Tulip scheme in rose spoiled by the introduction of a bed of washed-out violet Pansies creeping between the stems.

The effect of the whole, too, was disturbing. I do not feel at all certain that the laying out of the beds is the best possible one. But given this arrangement of large flat beds, so near each other as if they belonged together, of course they ought to have been treated accordingly, and one combination ought to have led up to, or set off, the next one, and in the arrangement of the whole, which is taken in at one glance of the eye, a clear, well-thought out scheme of harmony ought to have made itself felt. Here was an opportunity for showing that the gardener is, after all, an artist of higher rank than the milliner. The Lord of Misrule had it all his own way, while the prominent note, badly introduced, was the fashionable shade of deep solferino, which requires very careful treatment to be used at all.

Milton, Mass.

C. Waern.

Bird's-foot Violets in Cultivation.

To the Editor of GARDEN AND FOREST:

Sir,—The communication from your Missouri contributor, entitled "Wild Flowers in Cultivation," in GARDEN AND FOREST for April 6th, suggests an experience of my own in the cultivation of *Viola pedata* bicolor which may have interest for others.

In the early spring of 1887 I drove from Washington with a friend to Arlington Heights. The road-side, as we ascended from the river-bank, was decked with early flowers, and as we came to the foot of a long hill, up which we were to climb, the entire slope, from top to bottom, was aglow with the va-

riety of *V. pedata* called in Washington "Wild Pansy." We had never seen it before, and the flower, with its two upper petals of velvety royal purple, seemed singularly beautiful. When we reached the Pansy-hill on our return a temptation too great to be resisted was before us. We were not prepared for gardening, but, taking off our gloves, we grubbed up the Violet-roots, which fortunately came up easily, until our pocket-handkerchiefs were filled with them. On getting back to the city we packed the roots carefully and sent them to be planted in the garden at home.

When I arrived at home, the 1st of June, the Violets were blooming in the garden, and continued to bloom at intervals all summer long. The plants were still covered with buds when the first frosts came and nipped them. Having many fears lest the cold winter should prove fatal to these natives of a warmer latitude I covered them with leaves; but when the spring came round again and the plants were uncovered, they at once began to put forth fresh leaves and flower-buds and came into bloom the 1st of May.

They are still prospering in my sunny garden, which has a sandy soil well suited to Violets. In rainy seasons they blossom all through the summer until the frost chills them in the autumn. In dry seasons there are few flowers after the profuse bloom of May until September, when they bloom nearly as freely as in the spring. The flowers are larger and handsomer than they were when the plants were first placed in the garden, and many of the lower petals are freckled with royal purple. There is no Pansy-bed near my Violets, and hybridization cannot cause the markings, for they occur on the blossoms of the original plants.

Cambridge, Mass.

Caroline A. Farley.

Recent Publications.

A Handbook of West American Cone-bearers: Approved English names, with brief popular descriptions of the Cone-bearing Trees of the Pacific coast, north of Mexico and west of the Rocky Mountains. By J. G. Lemmon, San Francisco. 1892.

Mr. Lemmon has devoted himself of late years to a careful study of the cone-bearing trees of the Pacific states, and in the present handbook he makes an appeal "to botanists, naturalists, school superintendents and teachers, lumbermen, travelers, and tree-lovers generally," for fixed vernacular names for these trees, urging them "to ignore senseless inappropriate names for our trees, and to insist upon suitable descriptive distinguishing names, and to have only one name for each kind of tree," which he rightly considers should be taken up by the public and made the popular name. "I am not now advocating," he remarks, "the popular use of the scientific names; that will come in due time. The youth of America will soon be ashamed not to be familiar with our principal botanical names as with household words. It will be admitted that the only really distinguishing names are those conferred and duly published by scientists having full knowledge of the subject and its relations. These are the technical names—those of last resort—for they alone may infallibly distinguish any object in nature.

"Such names, of course, are written in Latin, but they may be understood by the learned of all nations. A person often hesitates about using them, ignorant perhaps of their proper pronunciation, and dreading the burden he fears they may impose on his memory. The coining of vernacular names is a very different matter, and such names are often a matter of chance, and too frequently made without a full knowledge." As an example of this, Mr. Lemmon points to the fact that "in one short range of California mountains there are seven different species of Pine. Four of these Pines are called by the same name, and that the meaningless one, 'Bull Pine.' Now, one of these species, *Pinus Coulteri*, bears the largest and heaviest cones in the world, a single cone often weighing five to eight pounds. What better name for this tree than 'Big Cone Pine?' A second, *P. Sabiniana*, has pea-green or grayish foliage, distinguishing the trees from others at a distance. 'Gray-leaved Pine' is suggested for this tree. The third species, *P. Jeffreyi*, has dark, often black, bark, finely checkered, in strong contrast with light-colored, well-known Yellow Pine (*P. ponderosa*), with which it is often associated. What better name," Mr. Lemmon asks, "for this tree than 'Black Pine'?" He then submits what he considers the most appropriate and best vernacular names for the different coniferous trees of his region in the hope that they will, by this useful publication, become familiar to the public, and so gradually established. We are glad to publish in this connection his names, in the hope of aiding him to bring about a most desirable reform.

P. Lambertiana he would call "the Great Sugar Pine"; *P.*

monticola, "the Little Sugar Pine"; *P. Ayacahuite*, var. *strobiliformis*, "the Arizona White Pine." For *P. flexuosa* and *P. albicaulis* he suggests "Rocky Mountain White Pine" and "Alpine White Bark Pine," although this last, it seems to us, would be sufficiently well designated by the shorter name of "White Bark Pine." *P. Balfouriana* is appropriately called "Fox-tail Pine," the name by which it has been known for many years; and *P. aristata* is here called "Bristle-cone Pine."

Of the Nut Pines, *P. monophylla* is called "Nevada Nut Pine," although the species is not confined to the state of Nevada. *P. Parryana* is called "Parry Nut Pine"; *P. edulis*, "New Mexican Piñon," although New Mexico is not the exclusive home of this species; and *P. cembroides*, "the Stone-seed Mexican Piñon," a rather unnecessarily long and awkward name. *P. contorta* is called "the North-coast Scrub Pine"; perhaps "Contorted Pine" would be as good a designation. *P. Murrayana* is called "Tamarack Pine," the name by which the species, from a fancied resemblance to the Tamarack of eastern swamps, is universally known to travelers in the high Sierras. *P. ponderosa* is called "Western Yellow Pine," and *P. Jeffreyi* "Western Black Pine," the variety of the high Sierras being called "the Sierra Red-bark Pine," and that of Lower California, recently portrayed in this journal, "Peninsula Black Pine." Upon *P. Arizona* is bestowed the somewhat awkward name of "Arizona Five-leaved Lumber Pine," a particularly unfortunate designation, as the leaves are not always in fives and the species does not produce especially valuable lumber. *P. latifolia* is called "the Arizona Broad-leaved Lumber Pine," and *P. Chihuahuana* "the Chihuahuana Top-cone Pine." *P. Torreyana* is appropriately called "the Torrey Pine"; *P. tuberculata*, "the Monterey Pine," and *P. attenuata* (of Lemmon), until recently known as *P. tuberculata*, the "Narrow-cone Pine." *P. muricata* is called "the Prickly-cone Pine," and *P. Banksiana*, which Mr. Lemmon reports from the Selkirk mountains in British Columbia, "the Canada Horn-cone Pine," a name which certainly is not more appropriate or easier to fix in the memory than "Gray Pine," by which this species is almost universally known in Canada.

For the Firs, whose identity and synonymy are more confused than the trees of any other group of western American conifers, Mr. Lemmon suggests that *Abies amabilis* shall be called "the Lovely Red Fir"; *A. nobilis*, "the Feather-cone Red Fir," a name which seems to us inappropriate; *A. magnifica*, "the California Red Fir," and *A. religiosa*, "the Mexican Sacred Fir." *A. lasiocarpa* appears as "the Downy-cone Subalpine Fir"; *A. grandis*, "the Oregon White Fir"; *A. Lowiana*, "the California White Fir"; *A. concolor*, "the Colorado White Fir," and *A. venusta*, "the Bristle-cone Fir."

It hardly seems necessary to designate *Sequoia sempervirens* as "the Coast Redwood," as it is the only California conifer called Redwood, or to call *Sequoia gigantea* "Giant Sequoia." To our taste "Big Tree" is a simpler and better name. For *Thuja gigantea*, "Pacific Red Cedar" is proposed, and for *Libocedrus decurrens* "California Post Cedar." *Chamaecyparis Nutkaensis* is called "Alaska Ground Cypress," but as this tree sometimes attains a height of one hundred feet and is by no means confined to Alaska, this name will hardly find general acceptance.

Cupressus Arizona is considered distinct by Mr. Lemmon from the species of Guadalupe Island (*C. Guadalupensis*, Watson), and is here given the name of "Arizona Red-bark Cypress," but as it is the only species known to grow in that territory perhaps "Arizona Cypress" would sufficiently designate it. Nor do we like "North-coast Cypress" for *C. Goveniana*, as the species is found as far south as the shores of the Bay of Monterey, or "California Mountain Cypress" for *C. Macnabiana*—a rare and local species which grows on the foot-hills rather than on the mountains. *Taxus brevifolia* is called "Pacific Yew"—a good name, although no better than the one by which it is usually designated in books, "Western Yew."

Mr. Lemmon, following Professor Greene, discards *Torreya* and adopts the earlier *Tuminon* of Rafinesque for the California representative of a genus known in Florida, where one species also occurs, by the vernacular name of *Torreya*; and as this is now a well-established name we venture to suggest, whether *Tuminon* be universally adopted by botanists or not, that the California tree be called "the California *Torreya*" rather than "the California False Nutmeg," as is here suggested.

Such criticisms as these which we have ventured upon show the difficulty of fixing on any plant a vernacular name which will be acceptable to every one, and will serve, perhaps, to emphasize the fact that the best name for any plant is the Latin name which is given to it in accordance with a fixed and

recognized principle, and which cannot be changed except in accordance with that principle.

We are glad to see, from a notice printed at the end of Mr. Lemmon's interesting paper, that correctly labeled specimens of branches, cones, foliage, etc., of the Pacific-coast conifers can be supplied by him to museums and educational institutions at reasonable rates. His address is 1015 Clay Street, Oakland, California.

Notes.

Next year will see the tricentennial celebration of the formation of a botanical garden and the establishment of a professorship of botany in the city of Montpellier, and this event is to be appropriately celebrated there by a special session of the Botanical Society of France.

The Hard Maple of Maine furnishes a large part of the material used in the manufacture of shoe-pegs, although the wood of the Canoe Birch is sometimes used for this purpose. Shoe-pegs are sold by the bushel, and now range from seventy-five cents to one dollar a bushel, \$150,000 having been received, it is stated by a correspondent of *The Manufacturer and Builder* of this city, last year by the Maine shoe-peg factories.

We learn that the necessary steps have been taken for the formation of an American Rose Society, and it is to be hoped that this will prove a vigorous organization. It is a singular fact that the Rose receives less attention in this country than it does in many others, and there is no good reason why we should not have a flourishing Rose Society, since the growers of Chrysanthemums and Carnations have both found such associations necessary.

Cratægus mollis, which is illustrated on another page of this issue, is now in full flower in this latitude. In Central Park there are many specimens of this Hawthorn which are twenty feet high or more, and their white blossoms, appearing abundantly among the tender young foliage, make a charming picture. It is not too much to say that at this moment these trees are quite as beautiful as any in the park, which is saying a great deal, when it is remembered that both the Chinese and American Red-buds are in full bloom, the flowers of the Sassafras are just opening, and the Flowering Dogwood is almost at its best.

A large part of the spools used in this country for winding thread are produced in Oxford County, Maine, and are made from the wood of the Canoe Birch (*Betula papyrifera*), although there are in western Maine several other important centres of this industry which occupy many saw-mills engaged throughout the year in sawing up Birch-logs into strips four feet long and an inch or two inches square. These strips are worked up in the spool-factories by most ingenious labor-saving machinery, the wood being fed into one machine, and hardly seen again until it drops from another in the form of spools ready for market, except the polishing, which is done by rapidly revolving them in barrels. In some villages of Oxford County nearly every inhabitant is more or less directly interested in spool-making, and in Maine several hundred thousand feet of Birch-lumber, which a few years ago was considered almost worthless, is now being manufactured into spools.

At the April meeting of the California State Floral Society, held in San Francisco on the 8th of that month, Mr. E. D. Sturtevant presented an interesting paper on aquatic plants and water-gardening for California, which, although considered a dry country, and therefore not favorable for the cultivation of water-plants, is well supplied, at least in the cities, with water. Natural ponds and lakes are rare, although a few exist in some parts of the state, and are suitable for the naturalization of the Lotus, a feat which has already been successfully accomplished in a lagoon not far from San Diego, and irrigating ditches afford ample opportunities for supplying a garden with water. In all of central and southern California, the Lotus, of course, would be hardy, and in the southern part of the state, no doubt, all the species which are grown under glass at the east could be kept over winter without protection.

From the third annual report of the Missouri Botanical Garden Professor Trelease has recently reprinted his monograph of the species of *Rumex* occurring north of Mexico. Nineteen species are described, and the paper is enriched by twenty-one carefully drawn plates with analyses. Of the North American species one is a so-called Ballast-plant—that is, it is found only on heaps of ballast discharged from vessels arriving from foreign ports; seven others are Old World weeds; two are Arctic alpine plants of wide distribution, and eleven belong to

the true North American Flora. "The chief biological interest in the genus," Professor Trelease points out, "comes from the acidity of the Sorrels and some Docks, and the occurrence of tannin and a bitter principle in some others; their protandry and exclusive adaptation to wind pollination, and the adaptation of the greater number of species to wind dissemination by the enlargement of the inner segments of the perianth during ripening"—a peculiarity which accounts for their prevalence in cultivated ground, where they are often exceedingly troublesome weeds.

A series of fifteen lectures and field-meetings are to be held at the Arnold Arboretum during May and June for studying the trees and shrubs which grow in New England. They will be conducted by Mr. J. G. Jack, and will be held on Saturday mornings and Wednesday afternoons. The lectures will be given in the Bussey Institute, after which the class will visit the plantations and nurseries of the Arboretum for an informal study of the plants which have been under review at the lecture. The instructions will not be technical, since it is the intention to indicate by comparison the easiest means of distinguishing our common native shrubs and trees and of recognizing foreign species which have been introduced into our gardens. The ornamental and useful properties of trees and shrubs, their habits of growth, their peculiarities and common diseases will be considered, and the different plants will be taken up as far as possible in course as they become conspicuous in flowering. An autumn course of fifteen meetings will also be given, when an opportunity will be afforded for studying many of the trees and shrubs in fruit with their autumn foliage and their buds and general appearance as they prepare for winter.

In our issue for April 13th Colonel Pearson wrote that where his orchard-trees had suffered from sun-scald they were all flat-footed—that is, they had no tap-roots—and on examining the trees which had escaped the damage he found that all of them had roots which reached deeply into moist soil and sustained their vitality during surface droughts. Professor Budd quotes this paragraph in the *Iowa State Register*, and adds some examples as evidence to support the theory that sun-scald of the stem is often induced by lack of water-supply. Three years ago a Soft Maple on the Iowa Agricultural College grounds was severely pruned and its top was cut back. That season the southern half of the tree sun-scalded badly, and it is alive now only on the north side. Professor Budd has often examined sun-scalded forest-trees, and found that in each case the roots have been injured by trampling stock, so that the soil was harder and drier than in the primitive forest. The comparative hardiness of original seedling Apple-trees, which stand where their tap-roots first penetrated the earth, and trees that are grown by root-grafting with cions taken from the top illustrate the probable truth of Mr. Pearson's theory, but do not prove it.

An English correspondent of the *Country Gentleman* writes that a leading London physician has just issued his annual plea for that much despised vegetable the Stinging Nettle (*Urtica dioica*). Since the plant has become to some extent naturalized in this country, it might be worth while for some adventurous cook to try its effect on American palates and stomachs. Here is what the physician says: "In early spring-time, when sprouts and cabbages constitute the chief supply of greens, those who know the delicate value of common Stinging Nettle rejoice to find that in its hardy vigor it comes shooting up in sheltered nooks and corners almost the first among the common harbingers of spring. Its tender tops, juicy, crisp and delicate, may be cut one by one with scissors held in a gloved hand, and when a basketful is obtained—and this can often be gathered in a single corner where a heap of rubbish has been lying—a valuable and health-giving adjunct to a meal is possessed. The Nettles should be well washed, and this can be done by stirring them briskly round in a pail of water with a stick, or by putting them under a running tap, and then put into boiling water. In about a quarter of an hour their stinging power will have disappeared, and they will be like very delicate Turnip-tops. They may be served in many ways, but perhaps one which will be found specially palatable is to treat them like Spinach and serve them on toast with a poached or fried egg. If Londoners would only ask for nettles, nettles would soon be found in the market, and a vegetable which is now the farmers' and gardeners' pest would prove a source of profit. Nettles are especially valuable for their diuretic and antiscorbutic properties, and would be found far more helpful in purifying the blood than the concocted 'blood mixtures' so persistently puffed and widely used."

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLES:—The Preservation of Natural Scenery.....	229
The Love of Trees.....	230
American Conifers in Scandinavia.....	Dr. C. E. Hansen. 230
Quaker Burial Grounds.....	Mrs. J. H. Robbins. 231
Notes of a Summer Journey in Europe.—XV.....	J. G. Jack. 231
Early May in West Virginia.....	Mrs. Dauske Dandridge. 232
NEW OR LITTLE-KNOWN PLANTS:—Menispermum Dauricum. (With figure.)....	234
PLANT NOTES:—Some Recent Portraits.....	234
A Double-flowered Cyclamen. (With figures.).....	Theo. Holm. 234
CULTURAL DEPARTMENT:—Winter Protection in Mild Climates,	
Professor W. F. Massey.....	234
Garden Strawberries.....	Wm. F. Bassett. 235
Notes from the Harvard Botanic Garden.....	R. Cameron. 236
The Spring Garden.....	J. N. Gerard. 236
The Wild Garden.....	T. D. Hatfield. 237
THE FOREST:—The Forests of California.—II.....	Hon. Wm. Alvord. 237
CORRESPONDENCE:—A Greenhouse for Amateurs.....	D. D. Slude. 238
No Flowers Sold in the Streets of Boston.....	E. 239
RECENT PUBLICATIONS.....	239
NOTES.....	240
ILLUSTRATIONS:—Menispermum Dauricum, Fig. 42.....	233
A Double-flowered Cyclamen, natural size, Fig. 43; Proliferous flower of Cyclamen, natural size, Figs. 44 and 45; A small flower from the same plant, twice the natural size, Fig. 46.....	235

The Preservation of Natural Scenery.

MORE than two years ago Mr. Charles Eliot called attention, through these columns, to the fact that within ten miles of the Boston State House there were several surviving fragments of the primitive New England wilderness, which possessed uncommon beauty, and more than usual refreshing power. One of these was the steep moraine of Waverly, set with its group of mighty Oaks; another was at the upper falls of the Charles River, where its rugged banks are covered with dark Hemlocks. Two others were groves of great White Pines, the tree which the forefathers of New England blazoned on their flag, and another was a bolder-strewn hillside which commanded a distant view of the ocean. Scenes of this kind in the older portions of our country are rapidly disappearing before the axe and fire, and carelessness of visitors and campers whose destructive invasion soon robs them of all their poetic charm. Mr. Eliot suggested that some association should be formed to protect places of this sort, and he argued with force that while lovers of art in great cities had shown themselves willing to found museums where select works of painting and sculpture were kept for public exhibition, lovers of nature who felt that natural scenery supplied a pure and elevating enjoyment as well as an education in the love of beauty, which was at least as valuable as that afforded by cast or canvas, might well unite in rescuing from destruction these choice bits of scenery so that they could be held secure for the delight and instruction of successive generations. The national Government has recognized the force of sentiment in this direction by setting apart the Yosemite Valley and the Yellowstone Park, and by empowering the President to reserve certain forest-areas as public possessions forever. By special enactment the state of New York has acquired possession of Niagara Falls, and by another special act Chittenango Falls has been protected from destruction and vulgarization. But we argued then that isolated efforts

would avail little in comparison with organized association, and finally some public-spirited citizens of Massachusetts prepared a plan which has since then been embodied in a state enactment. From time to time we have given reports of the progress of this movement, and we have now received the *First Annual Report of the Trustees of Public Reservations*, which furnishes strong ground to hope that, as the machinery of the law is understood, the intelligent and patriotic people of that state will see to it that many scenes of natural beauty and historic interest, now endangered by private occupation, will be rescued and dedicated to public use forever.

The act incorporating the Trustees of Public Reservations enables them to acquire and hold by gift, purchase or otherwise such real estate as may be worthy of reservation and to keep such property open to the public. According to the report, Massachusetts is shamefully lacking in spaces reserved for enjoyment by the public. The cliffs and beaches of the seashore, the mountain-tops of the interior and almost every scene of special beauty in the state are passing into the ownership of persons who hold them for their private pleasure or for the profit which may be reaped from fees collected from visitors. As the population grows, the destruction of the most beautiful passages of scenery which remain will go on more rapidly, so that the committee did well in the beginning to explore the field and secure some definite information as to the actual situation. Mr. J. B. Harrison was engaged to go through the seashore townships of the state and to discover to what places on the shore the public had a right to resort and what further provision was needed in this direction. The interesting letters from Mr. Harrison, which were published in this journal last year, are reproduced in this report, and we need not repeat the story of public holdings which have been assaulted and invaded until over a large portion of the coast there are few places of any kind to which the people can repair without the danger of being arraigned as trespassers. It is to be hoped that this work of examination will be extended throughout the state, so that a record can be made of all the beautiful and memorable places which it will be advisable to secure as public property. As it is, many other places which are notable for historical or literary associations or romantic beauty are mentioned, and the hope is expressed that this permanent Board of Trustees will find means to secure and protect them.

The first actual gift to the Trustees is one by Mrs. F. H. Tudor, of a diversified tract of woodland of some twenty acres in the south-eastern part of Stoneham. This is situated so that it will serve as a delightful retreat for a large population in a thickly settled district. A second proposal comes from a gentleman who expresses his desire to present one of the most interesting groves near Boston, and to give it into the keeping of the Trustees in memory of a young man who had a singular love for all natural beauty. The committee believe that, in the future, there will be many interesting examples of natural landscape preserved in *memoriam*, and it certainly is a beautiful idea to have a living landscape religiously guarded for this purpose as a monument much more impressive and enduring than any work in marble or stained glass. A third suggestion comes from one the name of whose ancestors is permanently attached to a picturesque situation, which will make a useful and handsome public reservation. There can be little doubt that many other places identified with honored names can be found which can be permanently preserved under the care of this Board.

Altogether, the formation of this Society and the energetic and broad-minded way in which its work has begun are most encouraging, and too much credit cannot be given to the originators and promoters of the movement, and especially to Mr. Eliot, who seems to have been most active in the enterprise. The single fact, that a way has been opened for securing places of recreation and assembly for the throngs in the rapidly growing cities and towns of Massachusetts, is of itself a matter for congratulation.

But of still greater importance is the fact that the refreshing and uplifting influence of natural scenery is recognized as an actual and practical truth. The humanizing influence of historic association may well be coupled with the soothing and healing charm of natural scenery, because neither of them appeals directly to any sordid or purely material interest, but to our nobler impulses and passions. The home of Washington, the winter camping-ground at Valley Forge, the beautiful old colonial mansion and grounds at Morristown, which was once the headquarters of Washington, address the same class of emotions as do the Natural Bridge of Virginia or the Big Tree-grove of California. They all minister in their degree to the mental and moral health of communities. In this country there are no remnants of royal hunting-parks for popular resort, and few public footpaths even which lead across private lines. As a nation our life has been so short that places of historic interest are few compared with those in the Old World; and broad as is our national domain, the scenes of natural beauty which are not private possessions are more rare than they are in countries with a much denser population. This Massachusetts movement ought to be contagious, for there are few states in which a special act of the Legislature is not needed whenever any land is acquired for public use. Of course, there must be a commanding public sentiment behind any act like this one creating the Board of Trustees of Public Reservations. As the report sets forth, the function of this Board is "to facilitate" the preservation of beautiful and historical places, and the appreciation of the value of such places, and the desire to secure them, must precede and make possible any action of the Board. When this sentiment comes in the fullness of its power it will not only manifest itself by securing and protecting by law a few tracts here and there, but it will be seen in a reverent regard for natural scenery over the entire face of the country. It will ensure not only intelligent treatment of these reservations, but it will help to protect every pleasing prospect from being marred, and it will act as a sensitive public conscience to protest against the obliteration and defacement of natural beauty and the desecration of spots that are hallowed by historic memories wherever they are found.

"EVERY one who has encouraged or even permitted the natural growth of his filial love for mother nature loves trees. Occasionally some such son or daughter has been carried so far by this fondness as to learn something about our trees and to know them for their own sakes, and many more have wished for some royal road to a knowledge of them. Some of these may be glad of the assistance of definite information concerning just what trees grow within easy walking distance of their homes, and just where such can be seen."

These sentences are from the introduction to a series of papers on Amherst trees which Mr. J. Ellis Humphrey is to contribute to *The Amherst Record*, the first part having appeared in its issue of the 4th instant, and it is this sort of assistance which the author proposes to offer to his fellow-townsmen, and to give them an annotated directory of the species of trees to be seen within a radius of a mile from the post-office of Amherst, Massachusetts, after the fashion of the papers originally contributed by Mr. John Robinson to *The Salem Gazette*, and lately published by the Essex Institute in a volume entitled *Our Trees*. Of Mr. Robinson's work we have spoken more than once, and we are pleased to notice that an authority of such rank as *Nature*, after stating that the book makes no pretense of being a scientific treatise, adds that "it is a series of homely chats about trees by one who knows and loves them, and, therefore, by one who cannot help telling you something worth learning, even though it be by the way and merely incidental."

The multiplication of these popular essays about our trees is a hopeful sign. It is surprising how little most

persons really know about the trees among which they have lived from childhood, and almost everybody would be grateful for some accurate information concerning them. If there are people so unfortunate as not to care to know about nature, it is possible, perhaps, to arouse their slumbering senses and to invigorate their faculties by pointing out the beauties and the uses of natural objects, of which, for this purpose, trees are the most available, as being almost everywhere present, of large size, picturesque appearance and general usefulness.

The more people, and especially the more children, there are in the United States who have learned to know and love and respect trees, the better it will be for the future of the nation. Our prosperity is dependent on the preservation of our forests. A forest is only an aggregated mass of trees. When we come as a people to know and appreciate and love trees we shall learn to love forests, too; and once loving them, we shall appreciate their value, and efforts to preserve and maintain them and make them useful and productive for all time will then be a comparatively easy task. But to do this a whole generation of Americans must be educated. The lesson must begin in the cradle, and it must continue year after year until our people love trees and know their value as well as they know the Constitution of the United States and their rights as citizens. It is for these reasons that every addition to our knowledge on this subject is valuable, and we therefore welcome the appearance of such papers as these Mr. Humphrey is publishing, and which we hope later to see gathered together in a handy volume which will serve as another text-book for the people of New England.

American Conifers in Scandinavia.

OUR correspondent, Dr. C. E. Hansen, of Copenhagen, who has charge of one of the richest collections of coniferous plants in northern Europe, sends us the following notes relative to certain American species in Scandinavia:

Sequoia gigantea has been tried in Norway in several places along the coast between Christiania and Molde in latitude 62° 44" north. In the botanic garden at Christiania a specimen six feet high when planted stood for several years, always losing in winter the growth of the previous season, so it is not probable that it will prove hardy there. In a garden at Balestrand a *Sequoia* about three feet high was planted in the spring of 1876; in the severe winter of 1880-81 the leader was killed back, although a new one was afterward formed, and in September, 1885, the tree had attained a height of seventeen feet and ten inches. In south-western Sweden the *Sequoia* seems hardy, although it is probably not to be found farther north than latitude 57° 42".

Thuja gigantea occasionally suffers from cold at Stockholm, but *T. occidentalis* is hardy at Upsala in latitude 59° 52" north; on the west coast of Finland it can be found as far north as 63°, and is said to grow as far north as 65° 51". *Taxodium distichum* is not hardy in southern Norway, and in Sweden it is rare and probably is not cultivated farther north than the southern part of the kingdom. Dr. Schuhueler, in his *Viridarium*, says of *Abies Fraseri*, that he has never seen this species anywhere in Norway except at Molde, in 62° 44" north, and in the botanic garden at Christiania, where formerly there were two plants. The tallest of these died in the summer of 1881, its roots having reached the wet subsoil. This specimen had produced good seeds for a number of years and was forty-five feet high, with a spread of branches of thirteen feet on the ground, and was forty years old. In Sweden this species is hardy at Stockholm, and is probably hardy in St. Petersburg.

In southern Norway plants of the Douglas Fir (*Pseudotsuga taxifolia*) may be seen fifty feet in height. In Sweden it is hardy at Stockholm, as is *Pinus rigida*. *Pinus Strobus* has been planted in many places on the coast of Norway up to latitude 63° 26" north, where it is hardy, and it may be expected to thrive even farther north. The largest plant in Norway is near Christiania, at Bagstad, and is about one hundred years old. This plant is eighty feet high, with a trunk circumference of more than six feet. Near Stockholm, in the park of the royal castle at Drottingholm, several fine specimens of this species are found. When I visited these trees I did not take their exact measurement, but observed that my arms would

not reach more than half around the trunks. Other specimens of this tree, all of about the same size, are to be found in Norway.

Pinus Jeffreyi has not been tried in Norway except in the botanic garden at Christiana, where there is a specimen fifteen years old and six and a half feet high. In Sweden this species is hardy in the south, as it is at Stockholm and at St. Petersburg. *P. ponderosa* is hardy in Sweden at Alwarp and at Gathenbourg. *P. cembra* grows well in southern Sweden, and in the vicinity of Stockholm increases in height at the rate of more than a foot a year. *P. Laricio Austriaca* is occasionally planted in Norway in the neighborhood of Christiana and occasionally as far north as 68° 12' north, where for a number of years it has proved hardy. The largest specimen I have seen in Norway stands in the botanic gardens at Christiana. It was planted in 1842 when it was a foot high; it is now thirty-eight feet high, with a trunk four feet in circumference. It has also proved hardy in the neighborhood of Stockholm and in Finland.

Quaker Burial Grounds.

THE final resting-places of the Society of Friends show the same severe and simple taste which characterizes their homes and ways. Repose and quiet are the keynotes of their well-ordered lives, and restfulness pervades the unadorned grounds where the plain people sleep their last sleep. The original custom was to have no stone to mark the grave of a member of the Society; and not even a mound to indicate the spot where a dead Friend was laid. Records of locality were, however, kept by the meeting, so that a man could know just where his family was interred.

There are some old burying-grounds in Pennsylvania where there was formerly only a plain stretch of greensward with a few trees, but for the last fifty years the custom of putting small stones to mark the burial spot has prevailed. In a very old ground at Abington, Pennsylvania, I found no stone earlier than 1840, showing that before that time they were not used, while rows upon rows of mounds, unmarked, showed where the earlier forefathers of the hamlet lie unchronicled. In another old grave-yard in Philadelphia itself, at Seventeenth and Cherry Streets, there are but few stones, and scarcely any signs of graves. Groups of trees and shrubs shade the enclosure, and the grass is green in this ancient spot, and dotted with small wild flowers. Around it circle brick walls of buildings, but the yard itself, which occupies a city square, is verdant and secluded. Many of the dead have been removed from this spot to larger suburban cemeteries, but some sunken stones still show where others lie undisturbed, and the turf is growing over many an unindicated grave.

The stones themselves in this, as in the other grounds I visited, are about eighteen inches wide, and but six or eight inches high. Upon the sides, sometimes upon the narrow upper edge of the stone, are chiseled the name of the deceased and the day and year of birth and death. On one stone only, among all that I saw, was there any other inscription, and that was a pathetic line from a heart-broken wife. On one other modern stone was the tiny reclining figure of a boy reading, the memorial of a deeply mourned son; but these were the only departures I observed from the plain severity of the rule.

There is a dignity in this quiet and unostentatious treatment of the dead which appeals to the mind as worthy and befitting. No "storied urn and animated bust" here records the fame and glory of the sleeper. Dust they are, and unto dust they return, and their little lives leave no haughty record of achievement. Peaceful are these old grounds, with their formal lines of trees, their unobtrusive stones, their stretches of green grass, and the quiet old meeting-houses standing beside them. The Abington meeting-house is situated in a fine grove of Oaks and Maples, somewhat disfigured by the unsightly sheds that serve to shelter the carriages of the worshippers, and through this we pass into the stiff enclosure behind the building, where the dead Friends are laid under the branches of spreading trees in silent array. Beyond the highway rise the great woods of Alverthorp, which add to the seclusion of this retreat from the world.

Another day I strolled up the quaint main street of Germantown, bordered with venerable houses, and found my way to the old ground that lies behind and around the orthodox Friends' meeting-house. Here are more overshadowing trees, and some of the graves are overgrown with English Ivy that has straggled from the wall and covered them with a dark green drapery, that must be put aside to read the names upon the gray and blackened marble. Wild flowers bloom here unmolested amid the turf, staring it with timid color. It was

the close of the Fourth Day Meeting, and groups of men in broad-brimmed hats, and of women in close gray bonnets, were emerging from the old stone building and softly wending their way homeward, with friendly hand-shaking and quiet words to each other. The girls and boys of the Friends' school were playing gayly in the sunshine, unchecked by the neighborhood of the dead. New houses stand unseparated, even by a fence or wall, from the burial ground, so that their groups of trees seem to form a part of it. As I came back I looked in at the windows of the old place of worship, where I have often sat in former days, and saw it still the same. The whitewashed walls, the rows of unpainted benches with gray cushions, the raised gallery for the preachers and elders of the meeting, the well-known air of cleanliness and quiet, of silence and recollection—all as of yore. The breeze was soft and spring-like, the birds caroled in the overhanging branches, the voices of children rang in the air, the dead slept peacefully outside, and I thought with tenderness of those beside whom I had sat in this venerable sanctuary who now lie beneath the sod, while their hallowed memory lives with a younger generation, perhaps straying from the simple and austere faith which, having fulfilled its mission, by preaching equality and liberty and the soul's direct communion with its Maker, is passing away from among us—the more's the pity, since the noble lessons of self-restraint, of order, of tranquillity of mind, of patience and simplicity, which its believers preached in word and life can never be outworn. The trouble is that it is a religion for the saint rather than the sinner, and demands the elect rather than the rank and file of struggling humanity for its members, and hence is little suited to a roystering world that desires praise, and noise, and glory, and a flaring record of life upon its tombstones.

As I passed, on my return, a modern cemetery crowded with monuments of unequal heights, with shafts and obelisks, and cenotaphs and sarcophagi in dire confusion, the ground splotched with gaudy flower-beds and blazing with color, I thought how much nearer to beauty was the idea of the Society of Friends, to whom a burial ground was a solemn lesson, not a spot for showy adornment, whether of marble or of herbage, but one where repose and silence should prevail, and no temptation to idle curiosity mar the serious scene.

Surely in the home of the dead there should be quiet and restfulness, rather than hubbub of color and violence of form, and we may well learn a lesson in taste from those who, believing in an unchanging fashion, mark the spot where lie the remains of those they love with the simplest record, the most unobtrusive head-stones, and write an epitaph only in their own faithful hearts.

Ingham, Mass.

M. C. Robbins.

Notes of a Summer Journey in Europe.—XV.

AFTER a week spent in the Jardin des Plantes its treasures can hardly be said to be more than glanced over, but where one has only two weeks to devote to the botanical and horticultural places of interest in and about Paris it is well to give some of the time to an examination of collections and institutions outside of the Muséum. Among many others, the park of the Petit Trianon, the favorite garden of Marie Antoinette, is likely to prove satisfactory to the admirer of fine trees and natural beauty. Many of the botanical treasures collected by the elder Michaux in North America were first brought here to enrich the Queen's garden. The gardens of Versailles, as a whole, may be more interesting to many persons than this little corner of it, but the formality of the great gardens of the palace, masterpieces as they are called, proved tedious and uninteresting to me. This is or was, beyond question, a great work, and withal an enormously expensive one, a work which probably contributed its small share in bringing about the Revolution. In its imperial days, too, when maintained in immaculate order, it no doubt seemed a very paradise to its frequenters. But, apart from its present partial neglect, how dreary and monotonous the gardens, formally clipped trees and straight-cut vistas seem to-day. The dry fountains, straight-edged canals, the geometrical figures and similar arrangements are a weariness to the eye, and one's sympathy goes out to the lines of trees, seen everywhere in the vicinity of the palaces, which, we are told, are cut and clipped in order to harmonize with the style of architecture of the buildings. Little wonder that Marie Antoinette preferred her "English garden," as she called it, and the park of the Petit Trianon for an occasional secluded retreat.

In the immediate vicinity of the little palace or château, on the side adjoining the Grand Trianon, the French or formal style of gardening prevails, and it is behind this that we find

the more secluded and beautiful tract which was laid out as the "English garden." Almost every visitor to Paris goes to Versailles, but after a weary pilgrimage of sight-seeing in palaces and show-grounds few get beyond the edge of the Petit Trianon. The picturesque dairy, boudoir and pavilion, built more than a century ago, now show unmistakable signs of deterioration and decay, but, with few exceptions, the noble trees remain in fine health and vigor. A Lombardy Poplar, which a label tells us was planted by Marie Antoinette in the reign of Louis XV., was broken by the wind in 1880, and now has only one green spot left on the side of its trunk. This little remnant is kept alive, and in connection with the roots, by a narrow living strip a few inches in width. The remainder of the trunk, six feet in diameter in its widest part, is quite denuded of bark and so decayed and hollowed out that only a mere shell remains. Cedars of Lebanon, *Zelkova crenata* and *Sophora Japonica* are among the best examples of introduced Old World species of trees in the park. It is said that the *Sophora* does not mature fruit here.

Through the industry of many of the early botanical explorers and collectors North American trees have a fine representation in the collection; in fact, this is probably one of the best places in France to see certain species. Here may be seen fine rugged old specimens of *Sassafras* and of Ash-leaved Maples, and vigorous trees of the Bitter-nut Hickory, *Hicoria minima* (*Carya amara*). The common *Catalpa bignonioides*, said to have been planted in 1726, is two feet in diameter, while our North American Red Mulberry (*Morus rubra*) has a trunk nearly as large and is a broad-spreading specimen, whose age is attested by its moss-covered limbs.

A Tulip-tree, to which a label is affixed bearing the date of 1663, is a fine example of this species, having a trunk two and a half feet in diameter; a Red Oak, said to have been planted just two hundred years ago, has a stem three feet through, and trees of the American Linden have attained fine proportions. They are, however, very much affected by Mistletoe, which causes irregular knots and swellings on the branches and limbs. Its effects at first give the foliage a sickly appearance, and later often causes the death of the affected limb. Great globular masses of the Mistletoe also seriously infest some of the large Poplars, but *Catalpas* and some other kinds of trees in the vicinity appear quite free from the parasite.

The visitor here has an excellent opportunity to study "knees" of the Bald Cypress (*Taxodium distichum*) of our southern swamps, of which there are some very handsome tall and thick-stemmed trees, said to be over two and a half centuries old. The trees being planted in the vicinity of a pond or lakelet, a part of its margin has become thickly studded with the "knees," which are of very various shapes and from one to three feet in height. I was surprised to find these peculiar growths extending so far from the trees, in some cases being distant from ninety to one hundred feet. The theory that these knees act as a support to the tree in yielding soil (*GARDEN AND FOREST*, vol. iii., p. 21) would hardly apply here, where they are comparatively slender and extend so far from the base. In drained portions of the ground the knees are noticeably very small.

Examples of our White Pines, with trunks four feet in diameter, and Douglas Spruces sixty-five or seventy feet high, attest the suitability of soil and climate in this locality to these favorite American conifers. The Red Cedar, or Savin (*Juniperus Virginiana*), exhibits various familiar forms or outlines, and we find old trees with their characteristic spreading and straggling habit and younger specimens of the more regular close pyramidal form, such as we commonly see in New England. Good examples of various species of Spruces, Firs, Hemlocks, Sequoias and other conifers might be enumerated.

The garden and nursery adjoining the park is quite worth a visit, and such old acquaintances as *Dirca palustris* and *Kalmia latifolia* are found to be represented by as fine rugged old specimens as can be seen anywhere in cultivation. Here, also, we find the true *Magnolia macrophylla*, a rare tree in European collections, those passing under the name sometimes proving to be our *M. tripetala*, or Umbrella-tree.

Arnold Arboretum.

J. G. Jack.

Early May in West Virginia.

FORSYTHIAS are now out of bloom, and so is the delicate and graceful little *Spiræa Thunbergii*. Their places are taken by the Japan *Corchorus* and some of the later *Spiræas*. Large clusters of these shrubs are mingling their flowers in the garden, and mask the foundations of the house effectively.

Both the white and the pink flowering Almonds are now in perfection of bloom. These shrubs never grow very tall, four

feet being their average height at maturity, and a group of three varieties, the white, the pink-flowering and the striped-bark Almond, are exceedingly pretty against the stone foundation of a country-house. Their suckers should be encouraged to grow and the pruning-knife used judiciously on the old wood to prevent the straggling appearance they are apt to assume in uncared-for old age. The ground about them should be kept mellow, and they ought to be mulched for winter protection, as they are not perfectly hardy. They well repay a little care by the extreme beauty of compact specimens when covered with their early bloom.

Wistarias are now clothing the trunks of their supporting trees and draping their branches with festoons fringed with clusters of purple flowers. With us these lovely vines seem to have alternate seasons of scarcity and profusion. Last year they gave us very few flowers, for which they are now atoning by a luxuriance which is delightful to the eye. They grow with amazing rapidity, and soon reach the tops of tall Locust-trees. The foliage of these trees does not give a dense shade, but just furnishes the shelter from the sun which Wistarias seem to require, as they bloom before the Locusts which they climb are in full leaf. Later in the season the tree and the vine mingle their blossoms with an indescribably beautiful effect.

One of the earliest shrubs in flower of the great family of Leguminosæ is the Chinese *Caragana* (*C. Chamlagu*). This is now blooming in a section of a shrubbery where many of its relatives are planted. Its small, glossy, dark green, pinnate leaves are so delicately beautiful, and its flowers are so large and showy, that it is a most attractive plant. When the blossoms open they are a clear yellow, but a few hours' exposure to the hot sun changes them to orange and brown, and they have almost the same range of color with the old-fashioned Wallflowers, one of the old plants beloved by our grandmothers. These are now in full bloom, and carry the memory back to days of childhood, when they were first known and loved.

Flowering Currants have bloomed abundantly this year, but are now fading. The numerous varieties of *Cydonias* are all so useful and pretty that it is hard to select a favorite. Between the charms of the various-named varieties in different tints of scarlet and orange one hesitates to choose. But the lovely white *Cydonia*, known as *Simplex alba*, captivates every beholder. This variety is perhaps most effective when planted close to one of the deep red sorts, though a clump of them standing alone is a very beautiful sight. *Gaujardii* and the other orange-red varieties are best by themselves, and are now strikingly handsome, blooming even more profusely than usual.

The buds of *Magnolia Lennei* were much injured by the severe frosts of April, and our one specimen of this tree did not produce a single perfect flower. The winter and late spring have been peculiarly trying to vegetation, and a fine *M. cordata* was killed outright, while a small Evergreen *Magnolia* safely housed under a barrel did not seem to suffer at all.

Staphylea trifoliata makes a pretty little tree about ten feet in height, and is a native of our woods. It is now profusely ornamented with raceme-like clusters of curious white flowers hanging from the ends of its branchlets, and which will soon be followed by large bladderly pods, which have given it its common name of Bladder-nut. It improves greatly under cultivation, and a specimen we brought from the woods two years ago has flowered more freely and grown more luxuriantly, and in more symmetrical form, than its wild relatives. *S. Colchica* is about a week later than our native plant, and is now in bud. It is a neat compact little shrub with glossy leaflets and very fragrant white flowers, much prettier than those of the American variety, which has little or no perfume.

Nevusia Alabamensis is showing a few first blossoms. These flowers dispense entirely with corolla; they have five green sepals and very numerous white, yellow-tipped stamens, and are produced so freely that they completely mantle the bush, and have a most dainty and feathery effect. The shrub is a rapid grower. Last year, in spite of the severe drought, it made very satisfactory progress, and threw up a root-sucker six feet in length. It is of the easiest cultivation, and is especially interesting to botanists from the fact that it is found in but one locality in Alabama.

The Red-bud and the large-flowering Dogwood are now the most conspicuous of our native trees. They are very often found growing, side by side, in the woods here, where they form a beautiful illustration of Nature's skill in grouping for effective contrast. Many copses of Red-bud have for background the delicate young foliage of Oaks and Hickories, and form a lovely fringe to the borders of deep woods. A large-flowering Dogwood, planted by itself in rich ground

where it can develop evenly on all sides, is one of the best of small trees. In such a situation it forms here a spreading tree twenty feet in height, and is now so covered with bloom that it appears to have profuse white foliage. Near it is planted the red-flowering variety, our specimen being at present about eight feet in height. The original red-flowering Dogwood came from Virginia, but trees whose flower-bracts vary from pure white are not rare. A fine specimen grows near us on the banks of the Potomac, and I have seen another in a distant

name an appropriate one. When a plant receives a common name it is a sign that it is becoming well known and loved, and no shrub of recent introduction is worthier of popularity than the graceful *Exochorda*. It is said to be short-lived.

Evergreens have suffered from the late frosts, and Peach-trees are giving very little bloom. Apples and Cherries and Pears promise an abundant crop.

In the wild garden Anemones, Trilliums, Columbines, *Mertensia Virginica* and *Phlox divaricata* are now most conspicu-

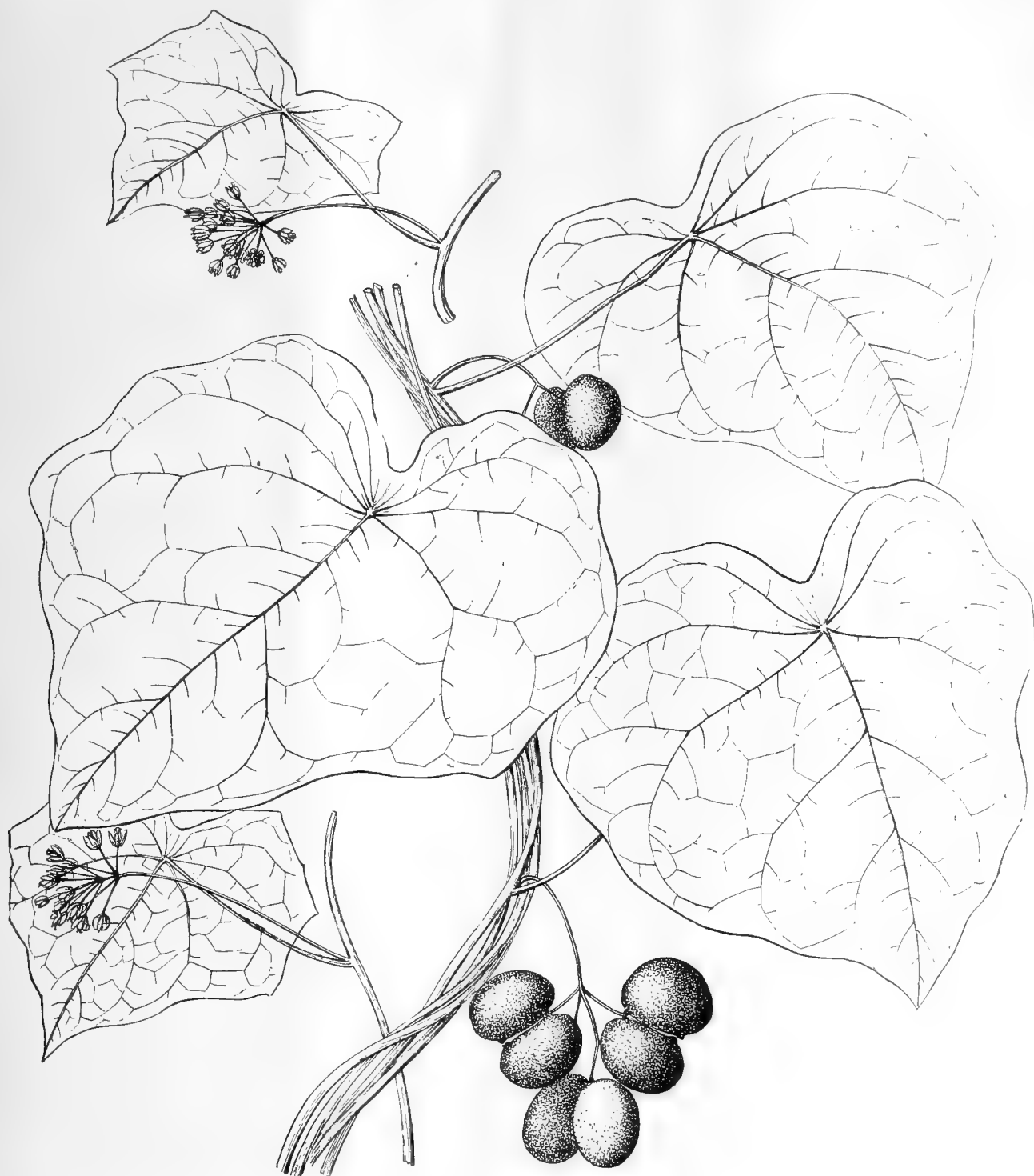


Fig. 42.—*Menispermum Dauricum*.—See page 234.

wood. The bracts are not pretty or showy until fully developed, when they gradually assume the pink of the Wild Rose.

The Japan Red-buds are showing very scanty bloom. Possibly, in the struggle for existence during the drought of last year, they had no vitality to spare for the formation of blossom-buds. They do not seem to be as hardy here as the native variety. *Exochordas* are flowering well. The common name for this shrub is Pearl Bush, and the round buds strung along the stems have a pearly whiteness and purity which make the

ous. The latter plant is very charming when given a little care. It needs partial shade, and is exceedingly pretty at this season, having a wild grace of its own, making it more attractive to a lover of untamed nature than any of its more cultivated relatives.

The garden is gay with bloom and musical with the songs of many birds, and, altogether, the old earth, in its renewed spring freshness, never seemed a more pleasant dwelling-place.

Rose Brake, West Va.

Danske Dandridge.

New or Little-known Plants.

Menispermum Dauricum.

THE genus *Menispermum* contains two species which so closely resemble each other that they can perhaps as well be taken for geographical varieties as species. The origin and type of the genus is a native of our northern states, where it is not rare on the banks of streams and in other low, moist situations; the second species, of which a figure is published on page 233 of this issue, is Asiatic, and appears to be common and widely distributed in Siberia, Manchuria, northern and central China, and in Japan. Like its American relative, it is a graceful woody climber, with slender stems which attain a height of eight or ten feet, but the leaves, which are thin and membranaceous, dark green and opaque above and pale below on both the American and the Asiatic plants, are on the latter often more deeply cordate at the base and less deeply angled. In their size and general appearance, however, as well as in the character of the flowers and fruit, the two plants are hardly to be distinguished. Both take kindly to cultivation, and are useful plants for covering small trellises or low screens, stumps or walls, although they make rather a heavy, solid mass of foliage, due to the interlacing of the delicate stems which wind one around another and do not reach out for other supports and so break up the pyramidal outline they form in growing. Both species are hardy in the northern states, and, in cultivation, produce an abundance of their handsome black fruit, which, although hidden under the leaves until these fall very late in the autumn without changing color, is more showy than the small long-stalked clusters of minute yellow-green flowers.

Plant Notes.

Some Recent Portraits.

THE colored plate in a recent issue of *The Garden* is devoted to a group of the hybrid Java *Rhododendrons*, of which a correspondent writes in the columns of our contemporary that "few, if any, greater triumphs of the hybridist could be pointed out than the magnificent forms of Java or tube-flowered *Rhododendrons* that are now to be found in our gardens, with which the name of Messrs. Veitch is so closely connected."

The first of these hybrids, known as Princess Royal, was raised about forty years ago by crossing the white-flowered *Rhododendron jasminiflorum* with the orange-flowered *R. javanicum*, the offspring producing pink flowers. This, the type of the race, is still one of the best of its color, and none of the more recent acquisitions surpass it in habit, foliage, or in the abundance of its flowers. Other species have since been used in the establishment of this garden-race, which now contains the blood not only of the two species mentioned, but also of *R. multicolor*, *R. Brookeanum*, *R. Lobbi*, *R. Malayanum* and *R. Teysmanni*. The offspring of these crosses produce scarlet, pink, yellow, white and rose-colored flowers, and the plants have the merit of remaining in bloom almost continuously throughout the year, provided they are subjected to a sufficiently high and moist temperature. They are not, however, very vigorous plants, and their habit often leaves much to be desired. Most of these hybrids produce single flowers, although among them is a small group with double flowers, to which the name of *R. balsamineflorum* has been given, from their fancied resemblance to the double *Balsam*-flowers. This double-flowered race originated from one bloom, which showed a tendency to make a double corolla, and which, being fertilized with its own pollen, produced seeds from which the double-flowered plants were raised. They are distinctly inferior to the single-flowered kinds in beauty, although they last much longer.

The writer of *The Garden* recommends the following varieties: *Luteo-roseum*, *Primrose*, *Jasminiflorum carmina-*

tum, *Duchess of Edinburgh*, the *Prince Leopold*, *Princess Royal*, *Duchess of Teck*, *Militaire*, *Aphrodite*, *Princess Christian*, *Brilliant*, *Favourite*, *Lord Woolsey*, *Princess Alexander*, *Queen Victoria*, *Triumph* and *Ophelia*. All of these and many others may be found in some of the best American collections, notably in Mr. Hunnewell's garden at Wellesley, where the cultivation of all *Rhododendrons* is made a specialty; and apparently they thrive in this country and give as much satisfaction as they do in England.

A Double-flowered Cyclamen.

AMONG the so-called garden varieties of plants those with double flowers often attract attention. These flowers are not only in many cases handsome, but often they have some interest to the students of botanical science. This character of "double flowering" is, however, attributed to different forms, in which a development of supernumerary organs, such as petals, has taken place. But there are recorded instances in botanical literature of other organs thus developed, especially in Masters' *Vegetable Teratology*. There may, then, be a distinction made between the cases in which an augmentation of parts of the flower has taken place as a result of overdevelopment, the affected organs being repeated over and over again, often without any transmutation of form, and other cases which ought more properly to be classed as examples of proliferation of the flower.

It does not seem to be common for both of these forms to occur on the same individual, yet it has lately been observed in a specimen of *Cyclamen Persicum*, which is cultivated in the United States Botanical Garden. All the flowers were abnormal and somewhat larger than in the ordinary form. In some of these, as shown in Fig. 43 (p. 235), the number of corolla-lobes was increased to eleven, but they all showed the typical form and color, light rose with crimson base, and were distinctly arranged in wreaths, so that no fission of the lobes seemed to have taken place. It was a case of simple multiplication of the corolla. The calyx was perfectly normal, but the number of stamens was increased to seven or eight, which, however, like the pistil, did not show any kind of transmutation of form.

Some other flowers of the same individual were, on the other hand, proliferous. There were developed here, inside the calyx, small whitish flowers, more or less distinctly situated in the axils of the five calyx-lobes and between these and the lobes of the corolla (Figs. 44 and 45). In these proliferous flowers the number of corolla-lobes was seven or eight, situated in wreaths, as in the flower described above. The calyx-lobes, the stamens and pistil did not differ, however, from the normal form.

If we examine one of these small flowers (Fig. 46) which has been removed from the specimen illustrated in Fig. 45, we see that there is no calyx, and that the very irregular corolla has eight separate lobes which are not distinctly arranged in spiral, and are not bent backward as in the normal corolla. These small supernumerary flowers were merely in bud, while the main flower was in full bloom, and the stamens and pistil were merely present as rudiments.

U. S. National Museum, Washington, D. C.

Theo. Holm.

Cultural Department.

Winter Protection in Mild Climates.

I HAVE been much interested in some experiments in protecting tender and half-hardy plants. In this climate the rhizomes of many *Cannas* will usually pass through the winter in the ground without any particular protection. This is particularly true of *Canna flaccida*, which is rapidly becoming a weed by running under fences and invading neighboring grounds. Those varieties which make very stout and short rhizomes of a more fleshy character are liable to be injured unless covered. *C. Ehemanii* keeps much better protected in the open ground than it does lifted, as its rhizomes will not endure drying as others will, and if lifted it must be put into a greenhouse and some degree of growth kept up. In the open ground it comes through in fine condition when covered with coarse manure or with sawdust. The *Crozy Cannas* came through with the same kind of protection.

Caladium esculentum did finely with a sharp mound of soil over the corms. So also did *Tuberous Begonias*. A sharp well-beaten earth-mound I prefer for these, as preventing too much access of water. *Amaryllis Johnsoni* and its allies all sur-

vived well with the coarse manure cover. Dahlias are commonly left in the ground here, but the losses are heavy from freezing of the buds from which the new growth is made. This could be prevented by the earthen mound, but I can see no advantage in keeping Dahlias over winter outside. I much prefer to lift and divide the roots after sprouting, and this sprouting I defer until as late as possible, so as to delay the flowering to a season more propitious for their flowers than our



Fig. 43.—A Double-flowered Cyclamen, natural size.—See page 234.

hot midsummer. In the warm lands near the coast I have seen Dahlias, that had been left out all winter, in bloom in spring, and the flowers there were fine, but here such tubers will get into bloom in June in our hottest weather, and are poor. By keeping them back as late as possible we can delay the bloom until August, and generally get fine flowers all the fall.

In the matter of trees and shrubbery we have still much to learn about winter protection. Abutilons, with a high mound of soil or sawdust around their base, will usually be killed back only to the top of the mound, and will grow strongly from the base. It is better, however, to cut them down as soon as the frost checks them to within a foot of the ground, and then cover all with earth. Erythrina Crista-galli does finely the same way, but I usually prefer to pot some and start early in the greenhouse for early bloom.

Figs, with large Pine-boughs stuck in the ground around them, hardly lose a bud, while those fully exposed are badly frozen. Tender evergreens, of course, cannot be covered with soil, but I find that Pine-boughs tied closely around Neriums and Gardenias bring them through in fine condition. I have one Gardenia florida on the east front of our college building, in a projection which shelters it from the morning sun, that has been otherwise unprotected, and is all right. The high brick walls around it doubtless absorb much sun-heat during the day and radiate it at night. In the warmer sections of the



Fig. 44.—Proliferous flower of Cyclamen, natural size.

coast country the Gardenia grows almost to a tree-like stature wholly unprotected. Double-flowered Camellias seem more liable to lose their buds in winter than the single-flowered ones. While single-flowered red Camellias are comparatively plenty, it is rare to find a good double variety in the open air. I am sure the trouble mainly arises from planting on the south exposure, as most people are apt to do with half-hardy things. Placed where the morning sun does not strike them, or pro-

tected by evergreen boughs, Camellias would do well in all of southern and eastern North Carolina up to the centre of the state. The perfect hardiness and fine growth of Azalea Indica here makes me wonder that so few are planted. They are largely used in South Carolina, but seldom seen here. The Azaleas which have been blooming this spring in my front yard have attracted much notice, and I have continually to be telling people what they are.

Agave Americana came through the winter without protection in full exposure to sun and north wind, but in a badly battered condition. With a board shelter to keep off sun and rain, it winters finely in dry ground. Musa Sapientum survived with a hogshead inverted over the crown and packed with dry firm straw. We are planting some Richardia Æthiopica in a Lily-pond, with the purpose of letting the roots remain in the mud next winter for summer flowers. In this same pond we had last summer a lot of Pontederia (Eichornia) crassipes. A friend told us they had lived over winter in his pond. We doubted it, and put some of them in a tub in the greenhouse. All that were left in the pond perished, as we expected. Lantanas, cut back and mounded with earth like Abutilons, are all right, and will doubtless prove very efficient with this mode of treatment.

Maltese Oranges of large size, in tubs, wintered perfectly in our cold grapery, and are blooming much better than they ever did in a heated house. Winter-garden possibilities under glass here are immense. There are so many things which the simple glass roof will preserve in beauty that I wonder that so little is attempted in this way. There are, of course, some flowers, such as Violets, Hyacinths and Daffodils, all winter outdoors, but there are times when they are much injured by frost, while the simple glass roof would keep them in constant beauty. Phlox Drummondii blooms all winter in our cold

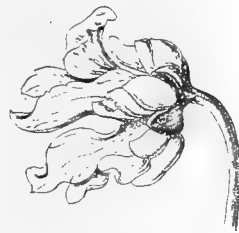


Fig. 45.—Proliferous flower of Cyclamen, natural size.



Fig. 46.—A small flower from the same plant, twice the natural size.

grapery, as also does Candytuft, Sweet Alyssum and Mignonette. Pansies are gorgeous in the Vine-borders.

It would be easy to make a long list of plants that could be used in an unheated conservatory here, and I have often been surprised that our enterprising proprietors of winter hotels have not struck the idea of a glass-covered garden for invalids as they have the glass-enclosed hotel verandas. I cannot imagine anything more attractive than a large airy conservatory, with everything planted out in a natural way on a lawn of Selaginella. We have a plan on foot to secure such a resort on our beautiful Capitol Square in Raleigh.

Raleigh, N. C.

W. F. Massey.

Garden Strawberries.

MR. BLACKNAL'S experience with certain varieties of Strawberries, in North Carolina, differs so widely from ours in New Jersey, that I am tempted to offer a few suggestions about the best garden Strawberries. Crystal City has been my favorite kind, notwithstanding it costs twice as much to raise as the average berry, and so long as I could do no better, I was willing to raise it at twenty-five cents a quart for its exquisite flavor for table use. It is a week earlier than any other berry, but if Michel's Early continues to do as well as it did last season, I shall depend upon that for a first early until we get some new variety still better, because, while it lacks a little of the sprightliness of Crystal City, yet it is very sweet and yields largely. I have never found a better second early kind than May King. It is a remarkably healthy and vigorous grower, with berries large, well colored, and as regular as though turned in a lathe. It is fairly productive and very sweet. Bubach No. 5 is a satisfactory mid-season berry, if given high culture, and under such circumstances it makes runners quite freely, but the runners are short-jointed, and where such a variety as Gandy will stretch out its runners two feet between plants, they would be only six or eight inches in Bubach, and this peculiarity causes it to make a handsome, compact bed. For a late fruit Gypsy has more good points

than any other. It is exceptionally healthy and vigorous and extremely productive, and the berries are large, of fine quality, with a glossy surface and rich color. It is, however, a pistillate kind. Cloud has only one recommendation, and that is productiveness. It is small, dull-looking and very poor in quality, and makes an immense number of small plants.

Pistillate varieties sometimes produce good crops when planted alone, and they are probably more likely to do so on rich land; but when such a result happens, it must, of course, depend on one of two things—either there must be some perfect flowering variety sufficiently near for insects to carry the pollen, or there must be enough development of stamens to effect fertilization. The last tendency varies considerably with different pistillates, and neither is fully safe to rely upon. It is much better not to allow the runners to grow than to thin out the plants, because it exhausts the plants largely to produce them. With such free-running plants as Crescent, I have found it a good plan to plant three feet apart each way, and then allow the first runners to grow, placing the young plants, as they form, in the row, in such manner as to have them about six inches apart, leaving a space of fully three feet between rows for cultivation, and, after this, remove all runners as fast as they show themselves. If the land is thoroughly enriched, they will produce big berries, and plenty of them. Of course, to secure the finest fruit, some clean mulch must be applied between the rows. The ideal mulch would be something, which, while it shaded and kept the soil cool and also protected the berries from the scorching sun, would still allow the rains to soak down freely and also a free aeration of the ground. Growing grass, not too thick, accomplishes this, but it draws both fertility and moisture, which makes it objectionable. Perhaps, where obtainable, Pine-needles, with a rank growth of foliage to shade the berries, come as near to meeting all these demands as anything we can use.

Hamonton, N. J.

Wm. F. Bassett.

Notes from the Harvard Botanic Garden.

FEW plants which flower in early spring are so much admired as *Adonis vernalis*. It belongs to the *Ranunculus* family, a native of southern Europe, and was introduced into English gardens 250 years ago. It grows from ten to twelve inches high, and the finely cut leaves are produced in whorls on the stem. The large yellow Anemone-like flowers, which are from two to three inches across, are produced one on each stem. It will grow in almost any soil, but to have this beautiful plant in perfection it ought to be grown where it can get plenty of sun, in good, rich, moist, sandy soil, and not often disturbed. It is propagated by careful division in the fall or by seeds.

The beautiful alpine Primrose (*Primula rosea*) has proved hardy here with a slight covering of leaves. It was sent to England in 1879 from the Himalaya mountains, where it was found growing from 10,000 to 12,000 feet above the sea, and also from Afghanistan, where it was collected on snowy ravines at 11,000 feet above the sea. It has a very neat habit, the leaves, which are pale green, being about four inches long, and forming compact tufts. The flowers are produced in heads like the *Polyanthus*, and when first expanded are carmine-pink, but gradually grow pale with a shade of purple. The flower-stem is from four to six inches high, and the single flower is nearly one inch across. In its native country it flowers from June to August, but here it flowers during April and May. It is planted here in a rather shady position in good rich loam. This beautiful little gem should be in every collection, and can be easily raised from seed.

The pretty little *Anemone ranunculoides* is growing in a rather sheltered spot here, where it has a covering of leaves thrown over it every winter. This is taken off in the middle of March if the weather is favorable, and in a few days after the plant is covered with its beautiful yellow flowers. It is a tuberous-rooted European species, very like our common Wood Anemone, but has rather coarser foliage, and the flowers are bright yellow instead of white or rose-colored. It grows from four to six inches high, and the flowers are produced either singly or in pairs. It is frequently cultivated in English gardens, and is also naturalized in some English woods, but is seldom seen in cultivation here. It grows well in a shady position with a well-drained sandy soil, and is propagated by division.

Alyssum saxatile has been in cultivation for over one hundred and fifty years, and it remains one of our most valuable early spring-flowering plants. It is somewhat shrubby at the base, and grows about one foot high. The golden yellow

flowers are freely produced in loose panicles, and if the weather is good they last in perfection for two or three weeks. It will grow in any sunny position with light sandy soil, yet it is seen to best advantage when it is planted in a sunny situation on the rock-work, where its prostrate stems can hang over the stones. It is easily and readily propagated from cuttings or seed.

Cambridge, Mass.

R. Cameron.

The Spring Garden.

THE Irises are now represented in the garden by the dwarf forms of the rhizomatous kinds. The first of these to flower is *I. Chamæiris*, a dwarf plant six to nine inches high, leaves broad, flowers a primrose-yellow, with light brown linings, orange beard, standards broad and well incurved. This is followed by *I. lutescens*, a slightly lighter yellow-veined brown, with yellow beard, standards not so broad as those of *I. Chamæiris*, and leaves narrower. *I. Olbiensis* is also dwarf, six to nine inches high, with broad short leaves; flowers purple, with a metallic lustre, and falls a very deep rich purple; a very attractive variety, and much like *I. nudicaulis*, of a similar, though not so rich a color, but with a more graceful habit of flowering and a trifle taller. *I. pumila* is one of the first of the group to flower. This well-known kind may be had in various colors, the type being a rather dull purple. The variety *Alba* is far from being a satisfactory white, the color being a dirty cream, dull and indistinct. *I. Sibirica* is one of the most attractive of those now flowering. It has narrow, erect standards, oblong falls veined with violet on a light ground. The leaves are narrow and rush-like, and in the variety, *Hæmatophylla*, they are stained a deep blood-like tint. The plant is from twelve to eighteen inches or more high, and very ornamental.

Rather handsome flowers are those of *I. oxypetala*, a beardless Iris with erect standards and narrow falls, of a beautiful soft light, violet or lilac shade, centres of which have a yellow ground reticulated with brown. The leaves are narrow and rush-like, and 1½ feet long. *I. Missouriensis* is of similar color and form, but without yellow, and rather more distinctly reticulated. Both of these are very desirable Irises, as is the lovely little Crested Iris of North Carolina, which is just opening. Nothing could be prettier in the season than a very dwarf border of this gem, with its bright flowers.

The first of the Germanica section are now showing color, and very soon the garden will be gay with a wealth of their showy flowers. Tulips are still in force, and whether they are interesting or not will depend very much on the varieties grown. A bed of Van Thol Tulips, such as ornament our parks in the spring, seems to me neither a work of nature or art. It certainly is not for lack of material that we are favored with plantings of yellow, red and white dwarf Tulips in hideous regularity. Nothing is more formal than a bed of the same class of Tulips, but this is formality and crude color combined. When we can arrange our own plantings we can arrange them with more unstudied art and use the various sections and species to give a less drastic effect, and by the successive flowering enjoy their brilliant colors for a long season. Why plant a Tulip-bed which shall be at the mercy of one shower? Among the kinds of Tulips which should always be planted are the Byblooms, Bizarres and Roses, the flowers of which are richly colored and late. Breeders, too, should be in all gardens. Good forms of breeders are not only beautiful, but interesting. These, of course, are richly colored selfs which have not yet rectified or taken on their true coloring. Seedlings I do not fancy so much, the "dropper" habit being more curious than satisfactory. Some seedlings of T. Gregg, which have been in my border four or five years, still keep up this habit, and so far do no more than show their prettily spotted leaves. Of other species, T. Gesneriana is one of the handsomest common kinds, but there are numerous smaller species which are full of interest. The florists' Tulips seem far enough away from some undetermined ones from Asia Minor, which form a very pleasing, graceful group in the border. These have narrow, very slightly glaucous leaves, and the small flowers are borne on flexible scapes. The colors are very peculiar shades of reds and yellows quite beyond me to describe. Other forms from the same section are dwarf, with rigid scapes, glaucous foliage and vivid crimson flowers. All have the sharp-pointed petals abhorred of the florist. In another respect this red variety differs widely from the hybrid Tulip in having a very thick felt-like tunic instead of the thin skin of the latter—from which I am inclined to think they will do better in a somewhat drier place than the full exposure of the garden, though they seem hardy enough.

Elizabeth, N. J.

J. N. Gerard.

The Wild Garden.

CLUMPS of Daffodil are found growing in moist meadows in the south of England and in many parts of Europe, and they can be very appropriately used in harmony with similar natural features here. On lawns they seem quite out of place, and it is in the wilder parts of the garden where they can be used most effectively. The best opportunities for developing a wild garden, by the natural disposition of suitable plants, are found outside of the limits of the kept grounds, and, where woodland abounds in the immediate vicinity, great care is required in the changing of the natural features not to draw the line too sharply. Many years ago the owner of this estate planted a space in the wilder part of the garden with a few native plants. The group includes the American Cowslip (*Dodecatheon Meadia*), the Closed Gentian, *Cypripedium pubescens*, *Aquilegia Canadensis*, *Adiantum pedatum*, and *Smilacina racemosa*. They are all thriving to-day without any special care.

It is a fact that many of the most beautiful and tender dwarf herbaceous and alpine plants do better when planted in grass, and disturbed only to free them from weeds. Such a lovely, yet fragile, plant as *Anemone deltoidea* can never be satisfactorily cultivated in an ordinary rock-garden, but if planted in a rather moist grassy spot it will thrive nicely. The same may be said of the pretty yellow *Anemone ranunculoides*, and, for that matter, all the *Anemones* belonging to the *nemerosa* type. *A. Pennsylvanica* is perfectly at home in the wild garden, and, in fact, it ought never to be cultivated, in the strict sense of the term. It is a species well worth growing, too, and gives a multitude of pretty cup-shaped white flowers, which are excellent for bouquet-work. It is liable in time, however, to become a nuisance, by monopolizing the territory allotted to other plants. *Viola pedata*, and especially the varieties *alba* and *bicolor*, and *V. lanceolata* are bright and unobtrusive little plants, as also are the Bluets (*Houstonia cœrulea*), although there may be some objection to the use of these where they are common in the vicinity. The star-shaped flowers of *Sanguinaria Canadensis* are strikingly bright. They come year after year and interfere in no way with the verdant aspect of the place they occupy. *Arenaria grammifolia*, *A. montana*, *A. verna* and *Stellaria Holostea* form neat white patches when in bloom, and afterward assimilate with their surroundings so well that their presence is not noticeable. So also do the common Moss Pinks, which just now are a blaze of color. The common *Silene Pennsylvanica* and the rarer Fire Pink (*S. Virginica*) are more at home in such a place than under cultivation. The double-flowered *Genista tinctoria* will be a perfect sheet of yellow while it lasts, and as it is a neat prostrate shrub looks quite natural when out of bloom. There are, also, in addition to several kinds of *Narcissus*, many other bulbous and tuberous-rooted plants which can be effectively used. These include the American Dog's-tooth Violet (*Erythronium Americanum*), Spring Beauty, *Claytonia Virginica*, *Dicentra Canadensis*, *Rhoxia Virginica*, *Calopogon pulchellus*, *Tulipa cornuta* and *T. suaveolens*. Plants used in this way want intelligent care, attention enough to protect them from crowding, or any such change in the natural features of the place as will make the wild garden look in any way artificial.

Where practicable, with sufficient shade, *Kalmia latifolia*, *Andromeda floribunda*, *A. Catesbæi*, *Rhododendron villosum*, *R. Wilsoni* and *R. ferrugineum* and choice broad-leaved evergreen shrubs may have a place, and where there is more sunlight flowering shrubs can be used.

Wellesley, Mass.

T. D. Hatfield.

The Forest.

The Forests of California.—II.

OUR issue for May 4th contained portions of a paper on this subject, read before the American Forestry Association at Washington by Hon. William Alvord, and the following are additional extracts from the same paper:

The Big Trees (*Sequoia gigantea*) have been discussed so thoroughly, especially by Dr. Gray in his essay on "The Sequoia and Its History" and by Mr. F. J. Walker in his admirable paper on "The Sequoia Forests" that little needs to be added here.

They are not found in any other part of the world, and in California only on the westerly slope of the Sierra Nevada, where they occur in groups, standing at intervals along a zone varying from 5,000 to 7,000 and 8,000 feet in height and extending for a distance of 200 miles.

In the Calaveras Grove, the farthest north and the first dis-

covered, there are standing 103 trees, twenty of which are about twenty-seven feet in diameter and 250 feet in height, and a number of prostrate trunks, which appear to have been much larger when in their prime.

One of the fallen trees in this grove is estimated to have been about 400 feet in height and thirty feet in diameter; the tallest in this grove is 260 feet, and in the Mariposa Grove 272 feet, and in the King's River Grove 300 feet. The thickness of the bark is sometimes two feet. In estimating California's lumber resources these trees have been left out, because the wood was not considered worth much for that purpose. Up to the present time some lumber, but not much, has been cut from the Big Trees in the counties of Fresno and Tulare, in amounts not to exceed, in all, 30,000,000 feet, some of which, on account of its finer grain, is now preferred to the Coast Redwood for interior finish, and has been sold for \$40.00 a 1,000 feet in San Francisco. The largest body of *Sequoia gigantea*, and of the densest growth, and perhaps containing more trees than all the other Big Tree groves in the Sierras combined, is on the seven-thousand-acre tract in Converse Basin, on King's River.

That these trees are very old is evident, but the annual rings are not clearly discernible throughout an entire section, therefore there are variations in the opinion of investigators; some hold that they are 4,000 years old, while others think that an overestimate, but it seems as if sufficient was known for us to fairly consider them as old as the Christian era. Dr. Gray beautifully says: "It is probable that close to the heart of some of these living trees may be found the circle that records the year of our Saviour's nativity." The Redwood grows from shoots and seeds and bears egg-shaped solitary cones about one inch long, but *Sequoia gigantea* grows from seeds only, and its cones are remarkable for their small size, being only one to one and a half inches in length. You may get an idea of their size by the average English walnut of commerce, which they resemble, although more oval.

The Redwood (*S. sempervirens*) is another noble tree, and its habitat is restricted to California and not broadly disseminated there; on the contrary, it is confined to a narrow belt of country lying along the sea-coast, its reach inland being nowhere more than forty miles, and generally not half so far. It may be said to reach from the ocean on the west to the summit of the Coast-range on the east. Beginning in Del Norte County, occupying the north-western angle of the state, the Redwood belt extends, with some gaps, down the coast four hundred miles, to Santa Cruz, where, it has been said, is the southerly limit of its growth; but I have recently seen some trees in San Jose Cañon, several miles south of Carmel Bay, and there is a grove of Redwoods about thirty-five miles still farther south, on the South Fork of Sur Chiquito, a good-sized trout-stream running through narrow cañons from its source to the ocean, the North and South Fork coming together about three miles from the ocean. The trees average smaller than those growing north of the Golden Gate, but Mr. F. S. Douty measured one that was thirty-eight feet in circumference five and a half feet from the ground.

Along the central portion of its range the Redwood occupies the ground to the almost entire exclusion of all other trees. Its distinguishing features are the great size of the trees, their amazing vitality and the thickness with which they stand together. Search the world over, and nowhere else will you find such an amount of timber to the acre. The trees vary in height from 180 to 250 feet, and in diameter from nine to twelve feet. They stand so thickly along the central portion of their range that there is hardly space for a team to pass between them. Twelve miles from Boulder Creek, Santa Cruz County, and less than one hundred miles from San Francisco, there is a Redwood-tree, called the "Father of the Forest," which is said to measure forty-two feet in diameter at its base, and twenty-eight feet five feet from the ground, and is nearly three hundred feet in height; the "Mother of the Forest" measures twenty-four feet in diameter.

In an acre of woodland near Highland, in Santa Cruz County, Mr. W. E. Emery and a friend counted two hundred and thirty-six trees from one and one-half to eight feet in diameter, and they estimated that a single tree of the latter size would produce from 15,000 to 20,000 feet of lumber, and from such an acre might be taken a quarter of a million feet, but the average yield per acre in lumber is 25,000 feet in Mendocino, Sonoma and Santa Cruz Counties. In Humboldt County some acres in flats along streams will yield as much as 500,000 feet, but careful conservative owners of Redwood-lands in that county estimate 60,000 feet as a fair average of lumber per acre. There are of these Redwood-forests more than two million acres, two-thirds of which are densely timbered.

The Redwood, as its scientific name imports, is exceedingly tenacious of life. Cut it down and numerous sprouts shoot up from its roots, and in a short time grow so thick as to hide the monster stump, and only repeated cuttings of these young shoots suffice to repress the tendency of the tree to reproduce itself. The wood is durable, light, splits freely, but is not very strong; nearly all the lumber used before the days of saw-mills was riven from this tree. A dealer in lumber in San Francisco recently filled an order from London for 100,000 feet of Redwood-lumber, cut from the bole, the stump and gnarl chunks, for use in houses, as inside finish in natural wood, and for furniture and cabinet-work. It is so good and handsome for such purposes there is no doubt that the export demand for it will increase.

T. H. Hittell, the historian, says: "In the eyes of many persons the Redwood is the most beautiful tree that grows, and the Redwood forest is the most beautiful forest in the world." Nearly all the land upon which the Redwood grows having passed into private hands, these forests are doomed to early extinction unless state or national pride and the good sense of those in authority authorize the purchase of a portion of them for public reservations.

The Port Orford Cedar (*Chamæcyparis Lawsoniana*), though really belonging to the forestry of Oregon, is mentioned here because there are a few groves in California about Mount Shasta. It is a large tree and very valuable, makes white lumber, hard but easily worked, takes a very fine polish, excellent for interior finish, also for flooring, ship-building, does not decay rapidly in the ground, and so is used largely for fence-posts. It grows from 130 to 180 feet in height, and is from five to ten feet in diameter. When young, like the specimens in the Golden Gate Park, about twenty-five feet in height, the trees are very handsome, the foliage drooping, and so thick as to hide trunk and limbs and touching the grass, make a graceful addition to the beautiful lawn.

The Madroña (*Arbutus Menziesii*) is a handsome evergreen tree, reminding one of a Magnolia, about fifty feet in height, with hard and strong wood and smooth brownish red bark. There is one of extraordinary size near the reservoir on Mount Tamalpais, Marin County, which is seven feet in diameter in the small part of the bole, and several branches measure from one and one-half to three feet in diameter. The bark is in demand by tanners, and the charcoal is sold to manufacturers of powder.

The California Laurel or Bay-tree (*Umbellularia Californica*) is a Coast-range evergreen tree, two to four feet in diameter (sometimes larger), fifty to eighty feet in height; leaves plentiful and strongly aromatic; wood light-colored, close-grained, takes a very high polish, and is valuable for wainscoting and cabinet work, and is quite as handsome as Satin-wood.

One is attracted to the lumber-forests of California by their agreeable shade, cool clean grounds, resinous odors, and the knowledge that one will not find annoying insects or reptiles to trouble, nor will timid tourists find wild animals to frighten them. Much has been said about the wasteful methods of our people in dealing with their forests and forestal products; while these methods cannot be altogether justified, something may be said in their extenuation. Judged by ordinary criterions, it would be an easy matter to convict our people of other excesses than these. We were at first just as prodigal in disposing of our gold-bearing deposits as to the casual observer we may seem to have been in disposing of our forest-resources. The pioneer miner worked only the richest portions of the gold-bearing gravel, leaving the poorer untouched, nor did he work the richer ground with much closeness, simply because it would not pay to do so, food was so high.

When it came to settling upon and cultivating the land a like policy was pursued—the more fertile and accessible being chosen, and the poorer neglected. So with the pioneer woodman, needing lumber, he picked out and felled the best trees, and from these selected the parts that suited him the best; this culling and rejecting was but a rude sort of thrift; why should he accept the poorer when there was enough, and, to his mind, an inexhaustible supply of the best?

But, however it may have been in the past, there is but little of this timber-devastation now going on in California on account of the more accessible lumber-forests having become private property, and the owners are careful to guard against any undue waste. Then, much of the tree that was formerly rejected as valueless is now utilized by the millmen, the creation of new uses for the inferior lumber and the employment of improved machinery having made this possible. Into our larger mills improved mechanisms are constantly being introduced, so that even the smaller economies are not neglected. In this manner the percentage of material in the standing tree

has been increased twenty to thirty per cent. As in the mills, so in the logging-camps, the tendency is toward economy, both in saving the raw material and in the cost of handling it.

The continued prosperity of California depends upon its mountain-forests. They should be well protected, and extended where possible, and this truth should be constantly reiterated and amplified.

Correspondence.

A Greenhouse for Amateurs.

To the Editor of GARDEN AND FOREST:

Sir,—I have long desired a small greenhouse for propagating and cultivating a few plants, but have been deterred by the probable trouble and expense until last autumn, when I began to study the matter. Among other authorities consulted, I found in GARDEN AND FOREST, vol. iv., pages 55 and 67, an article entitled "Plant-houses for Amateurs," in which Mr. Gerard gave much of the information I wished. This was deficient, however, in its instructions on several points where novices need information, and I have therefore thought that my experience during the past winter might have some value.

In the first place, as to location, the greenhouse should be as near the dwelling as possible. This will be found essential to the comfort of those who intend to do their own work. The exposure to the tempestuous nights of winter for the necessary attention to the fire will be lessened by this propinquity. Of course, the structure should face north and south, and if possible should be protected by some shelter from the north and north-west winds. My own greenhouse is placed on the eastern end of a children's play-house, with which it is connected, while a belt of evergreens sheltered it on the north. The advice of Mr. Gerard was followed as regards size, and this resulted in a span-roof house with seven-foot ridge, eighteen feet in length by ten feet in width. The sash extends fifteen feet, and it is boarded for three feet at the western end. The side walls are of hemlock-boards covered with building-paper and clapboarded with the best material. Upon the inner side the walls are sheathed with matched pine-boards. In addition to the five three-foot sashes on east side, which are hinged at the top, so that they can be lifted, the eastern gable end is of glass, for which the sash was necessarily made expressly. In this one or two panes were made to slide for ventilation. For the foundation, timbers were laid upon cedar-posts, set deep enough to be secure from frost. Of these there were three on each side. As the surface of the ground fell off to the east and north, and in order to bring the building on a level with the play-house, a stone wall was needed. For this purpose a ditch was dug under the outer walls of sufficient depth and filled with small stones, which serve also as a drain for surface water. Upon this were built the walls of common field stone, laid in mortar, and pointed inside and out. The enclosed area was then filled with good garden-loam, thrown in before the sashes were put on, to a level with the base of the wood-work. This was an expense which would not have been required on level ground. The building is all the better as to durability, but the cedar-posts under ordinary circumstances would answer every purpose. The foundation-walls upon the outside were banked and sodded for increased warmth and for appearance.

The greenhouse proper was securely fastened to the play-house by continuing the timbers and shingled roof, thereby affording an additional length of about eight feet in front for a potting-bench, with ample room beneath for potting material, pots and a box for coal. Entrance from the outside was obtained by a common battened door, and this cosy little space was well lighted by a four-foot sash placed lengthwise. At the back of this room, separated by a partition from the plant-house, was placed the stove. One coat of white-lead paint was given to all the wood-work outside and inside.

As to heating, since the hot-water apparatus, with its stove or furnace and expansion-pipe, is thought the best by florists, I assumed that it was best for my purpose. Fortunately, I heard, by chance, that several Baker heaters, formerly used by a railroad company for warming passenger-cars, were for sale at a low price. One of these, in excellent condition, with the expansion-pipe, was accordingly selected, and, being already jacketed, was exactly the article for my house. A simple stove-pipe was passed out through the roof and carried up sufficiently high above the adjacent play-house to secure draft. The heating-pipes consist of a single two-inch flow and return, connecting with a series of five pipes, which completely encircle the house.

The whole apparatus has been most successful, giving, with a moderate fire of anthracite, a night temperature of fifty degrees during the coldest weather. The amount of fuel consumed has not exceeded on the average more than two common hodfuls in the twenty-four hours. The supply of water for the plants was afforded by sinking a common whisky-barrel in the ground beneath the benches, and filling this by means of a portable hose, connected when needed with the faucet in a neighboring stable.

In the arrangement of the interior of the greenhouse a bench was constructed on each side, three feet high, with a depth of four feet, the hemlock-boards being cut off this length and placed within a half-inch space and left movable. The supports are of galvanized iron half-inch pipe, which are neater, stronger and more durable than wood. At the extremity of the northern bench nearest the stove a space of about four feet in length was reserved for a propagating-bed, the bottom being of common roofing-slate, and the area beneath boarded in to confine the heat.

The central walk of two feet in width between the benches has a flooring of North River flagging-stone, laid down without cement. The greenhouse cost slightly more than two hundred dollars. It might have cost less, especially in the arrangement of the heating-pipes, in which experience on my part was wanting, but I am satisfied. The house has been an unending source of pleasure to us all. An abundant supply of common window-plants has been propagated by cuttings, various kinds of seeds have been raised, and the area below the benches devoted to various Ferns, running plants and shade-loving vegetation, while *Tropæolums* and other vines have been trailed along the centre overhead—all, too, under the sole supervision of a daughter, whose tastes have thus been gratified, as may those of many other of our female readers.

Chestnut Hill, Mass.

D. D. Slade.

No Flowers Sold in the Streets of Boston.

To the Editor of GARDEN AND FOREST:

Sir,—All those who love the spring and its flowers must feel like remonstrating against the exclusion of the flower-venders from the public streets in Boston. A week ago they were like a garden. There were May-flowers and Daffodils everywhere inviting every passer-by to take them, or at least to take a look, and carry away a memory of spring. Here was a boy with great bunches of Roses, Carnations, Sweet Peas and Ferns, and purple Pansies "for thoughts"; and there were more boys with Marsh Marigolds to remind each man who passed of the brooks and meadows as he knew them in his boyhood. Everywhere there were women with a handful of flowers to offer, flowers of the field and garden and wildwood—all with suggestions of the country and the spring. But these are all gone—boys, flowers, and smiling, interested women and the pleasant thoughts suggested. There are some florists' windows left to look into, and these are beautiful, but the plate-glass window will not allow us a touch or smell, and the sight alone brings no thrill of remembrance and delight. Nowadays, when it is held that beauty is a great educating force, should we not protest when so much of it is swept away from the streets where every one can enjoy it?

Boston.

E.

Recent Publications.

The Genus Masdevallia. Issued by the Marquess of Lothian, K.T., chiefly from plants in his collection of Orchids at Newbattle Abbey. The plates and descriptions by Miss Florence Woolward, with vignette engravings from photographs, and additional notes by Consul F. C. Lehmann, German Consul in the Republic of Colombia. Dedicated by permission to Her Majesty the Queen.

The first two parts of this remarkable book have just been sent out to subscribers, and may be procured from Mr. R. H. Porter, 18 Princes Street, Cavendish Square, London, at the price of £1 10s. each. It is intended to be published in about twelve parts, each containing ten folio plates, and from what we know of its authors we may fairly believe that it will be completed in a reasonable space of time. The genus *Masdevallia* is one which, on account of the extreme delicacy, beauty and curiosity of its numerous species, and of the difficulty of introducing and cultivating many of them, is of great interest both to botanists and Orchid-growers, and well deserves the pains and skill which have been lavished upon it by the authors, both of whom have done their parts remarkably well. For, though neither of them lays claim to the title of botanist, yet the book is one which will be indispensable both to bota-

nists and horticulturists and to those who love illustrations of beautiful plants. The drawings, lithographs and descriptions are the work of a lady and an amateur, but the book will take high rank among the most beautiful scientific works of the century. Miss Woolward's drawings are not of the style which is affected by some artists of her sex, who sacrifice exactitude of structural detail to artistic effect; they are, on the contrary, of a more botanical character, and though in some cases there is a certain stiffness about them which the artist pure and simple might criticise, yet they are most faithfully drawn and colored from the living examples, and show the curious and minute details of structure in these wonderful plants in a way that no ordinary artist, however skillful, could have done. The Marquess of Lothian, whose love for these delicate plants has led him to devote to their cultivation the leisure snatched from the numerous and pressing engagements of a minister of state, is fortunate in having found an artist of such ability and industry to draw and describe them. We have recently lost Miss North, who was distinguished above all her sex as a traveler and painter of floral beauty, but we may say that in Miss Woolward a most worthy successor has appeared, though her drawings are of a totally different character. It is unusual to find a lady who can look at plants in the truly scientific spirit which Miss Woolward shows, and so far as we know she is the first who has combined with this spirit the power and will to carry out such a work as this in a thorough manner. Laboring under many difficulties which only those who have had experience in similar work can realize, and deprived by the extraordinary will of the late Professor Reichenbach of access to the collection which was almost indispensable to a complete knowledge of this genus of Orchids, it was not possible that this monograph should be absolutely complete; but it is a work which will astonish many who only know the few species of *Masdevallia* which are found even in large collections of Orchids.

The co-operation of Consul Lehmann, who perhaps of all men knows most of the plants in their native country, and his notes on the climate of the localities where *Masdevallias* grow, will be of great use to cultivators. The bibliography, synonymy and descriptions appear to be most careful, concise and systematic, the history of the plants is given as far as known at present, and we are sure that any collectors or growers of these plants who possess rare species will do well to communicate with Miss Woolward, and, if possible, send her flowers of unknown or doubtful species.

Such a work as this, together with the excellent manual of Orchidaceous plants which is being published by Messrs. Veitch & Sons, of London, aided by the activity and enterprise of Orchid collectors in South America, will, no doubt, increase the number of amateurs who devote themselves to the study and cultivation of these plants.

The twelfth bulletin of the *Salem Public Library* is devoted to botany, and contains, first, an introduction in which some sound advice on reading in botany is given; second, a special reading-list of botanical works, and third, a special reading-list of works on agriculture and gardening. "Botanical reading," the introduction tells us, "may be of two sorts. We may read to obtain a knowledge of the structure, physiology and uses of plants, or to become acquainted with the plants of certain regions. In either case some general knowledge of the natural divisions of plants is essential, but even before this knowledge can be obtained there must be a thorough understanding of the simple elements of botany, so that the terminology of certain advanced books may be readily comprehended, for in every branch of science there are terms which must be continually used, and the author must take for granted a certain amount of elementary knowledge on the part of the reader of the methods of treating the subject. Botanical reading—in fact, all reading on subjects of natural history—should be accompanied by continual examinations of specimens, living specimens wherever possible, in the case of plants and animals, with the aid of a magnifying-glass when required." And the bulletin goes on, sensibly, to insist "that the gardener, florist, woodsman and carpenter will work more intelligently with the aid of a course of botanical reading. Our walks to and from business in our city streets can be made more interesting, and the study of their daily changes and growth will awaken a desire to know more of plant-life generally—at least, to cultivate a quality of observation." The special reading-lists seem to us to be admirably selected and to cover the entire field, embracing not only physiological and structural botany, but such special subjects as the Evolution of Plants, Descriptive Botany, Trees (American and Foreign), Grasses, Cryptogams, Ferns, Mosses,

Lichens, Fungi, Algæ, Geographical Distribution of Plants, Local Floras of Essex County, and the Floras of the principal geographico-botanical regions of the earth, Fossil Botany, Economic Botany, Folk-lore, a list of serials, works on Floriculture, Landscape-gardening, Forestry and Fruit-raising. Altogether, this is one of the most intelligently prepared and helpful aids to a study of botany which have yet come to our notice.

Notes.

Owing to the appearance of the *Phylloxera* in California, Grapevines from North America are now rigidly excluded from the territory of the French Republic.

Mr. H. E. Van Deman, Pomologist of the Department of Agriculture, writes to the *Florida Agriculturist* to protest against the use of the name Grape-fruit and to insist upon the name Pomelo, which is appropriate, distinctive and the one commonly used in the East Indies for the delicious fruit which is found in increasing quantity every year in our northern markets.

We have seen no more beautiful Pansies this year than some which were sent to this office by Mr. D. K. Herr, of Lancaster, Pennsylvania, and which were grown out-of-doors in ordinary garden-soil. The delicate markings in some of the newer strains of Pansies, like Bugnot's and the improved Trimardeau, are among the most interesting products of carefulness and skill in selecting and cultivating garden-flowers.

The correspondent of the London *Garden* writes of the Waban Rose, which was exhibited at Drill Hall not long since, that it fully justifies the praise it has received in this country, retaining as it does the matchless form of Catharine Mermet, of which it is a sport, and a color some shades deeper. It is predicted that, like The Bride, another sport from the same variety, it will be esteemed among the choicest of the tea-scented Roses.

A great many of the ordinary bedding-plants, like Zonal Pelargoniums, Heliotropes, Verbenas, etc., receive a severe check or die outright if they are suddenly exposed to the outdoor weather, especially when cold rains or high winds follow. All plants of this sort should be gradually hardened off until they are inured to outdoor conditions. When tender plants are taken out of the house or pit and placed in the open ground the common mistake of watering them too freely should not be made.

The editors of the *Revue Horticole*, in speaking of the different varieties of the Althea (*Hibiscus Syriacus*), remark that the single flowers are generally the brightest in color. The pure white variety, known as Totus albus, is considered the best, and the following double and single varieties are recommended: Albus plenus, Pompon pourpre, Purpureus plenus foliis variegatis, Cèleste, Lady Stanley, Duc de Brabant, Charles Breton, Pæoniciflora, Leopoldi, Comte de Hainaut, Ranunculiflorus albus, Violet simple, Cœlestis simple, Speciosa rubra, Violacea variegata, Carneæ plena.

Commenting editorially upon the proposition that a special exhibit of roadways, pavements and road-making processes and materials shall be made a prominent feature of the World's Fair at Chicago, the *American Architect* says that such a display would come under the eyes of myriads of our fellow-countrymen "who have never seen a decent road and have no conception of the method of making one. If the exhibition should contain nothing but this, it would be worth holding, for it is no exaggeration to say that the question of roads is the most important one to be solved in this country."

In the *Transactions of the Indiana Horticultural Society* for last year, which has just been received, there is a list of the trees of that state prepared by Professor Coulter, of Purdue University. One hundred and eight species belonging to fifty-two genera are mentioned, so that Indiana is behind several of the other states in the variety of its arboreous flora, and notably of Arkansas, which has one hundred and twenty-seven species on the list made by Professor Harvey. There are few states, however, where so many of the trees attain so large a size. Forty-two species are named which attain a height of a hundred feet or more in the Lower Wabash Valley, and thirteen are mentioned as growing more than one hundred and fifty feet high. The figures are taken from actual measurement, but since few trees were measured, compared with the vast number of matured trees which are cut down in a single

year, Professor Coulter thinks that it is quite improbable that the largest individual of any species which has stood in the Wabash Valley within the last twenty-five years has been measured. The tallest tree mentioned is a Tulip Poplar, which was one hundred and ninety feet high. This tree was twenty-five feet in circumference above the swell of the roots, and the height of the trunk to the first branch was ninety-one feet. The next tallest tree measured was a Scarlet Oak, the third a Pecan, and the fourth a Cottonwood.

At a recent meeting of the Nantucket Improvement Association a vote was passed urging upon the members of the Congressional delegation of Massachusetts to resist all attempts to encroach on the public lands of the Yellowstone Park reservation, and quoting from the article which appeared in these columns on the 20th of April last, the resolution goes on to declare that, "This reservation is important as a means of protecting the head-waters of one of the largest and most useful rivers of the country; as a region where some of the grandest scenery of the world is located; as an extensive tract of forest, mountain and valley in which may be preserved, for all time, fine and numerous specimens of the flora and fauna of the Rocky Mountain regions." The Nantucket Improvement Association, which last year was active in creating public interest in national forest-preservation, is now urging all organizations similar to its own to appeal to members of Congress "in order to secure the general and widespread expression of a desire for the protection of the public interests against personal encroachments upon the same."

We have heard it suggested several times recently that the spring coloring of the foliage of the trees is more beautiful than it was in former years, and inquiry has been made whether there is not some climatic change either in the character of the winters or perhaps in the autumn, when the wood ripens, to produce this effect. It is very difficult to remember one year just how the trees looked a year ago, and it is probably the truth that the leaves are no more beautiful this spring than they were last. Perhaps it is true that there is a growing admiration and affection for natural beauty, and it certainly is true that there is a growing taste for more delicate tints and textures. The autumn woods have a glory of their own which compels the admiration of every one, but the soft spring colors make an equally impressive appeal to the eye and to the imagination. Of course, the tender greens predominate, but yet they appear in a variety which is almost infinite, while the bronze of the White Maples, especially when the sun is shining through the leaves, has a marvelous depth and richness. No words will avail to describe the tender pink on the border of the young leaves of the White Oaks, which is subdued as if it had a veil thrown over it so as to make it blend more perfectly with the soft silvery gray of the body of the leaves. This delicacy of coloring is matched by the exquisite and downy fineness of the surface texture of the foliage, and the almost fragile beauty of the tint and tissue of the leaves is heightened by its contrast with the gnarled and sturdy strength of the tree which bears them.

English lovers of the Daffodil have begun to inquire whether the newer varieties which are put on the market every year are really improvements on the old sorts. Some of these novelties are said to have feeble flowers of little substance and a delicate appearance, quite inferior to the rich yellow color and noble bearing of the older kinds. Again, in the rage for something new, the trumpets of some of the recent kinds have been developed into shapes that are almost monstrous. As developed by nature the flower in color and shape has acquired a perfect balance and complete adaptation to its conditions, and although in many instances human selection may transform wild flowers into something more beautiful than the original, yet there is a point beyond which change does not seem to be improvement. Certainly the wild English Daffodil or the Poet's Narcissus, which are both natural forms, are lovely enough, so that it is hardly worth while to pay enormous sums for bulbs that bear less beautiful than these simply because they are new. Buyers are now confused by hundreds of different sorts which are sold under fancy names, when perhaps a dozen, or at most twenty, distinct types for varied and successive planting will answer most purposes for ordinary gardens. While all this is true, there is another view of the case. It is this care for nice distinctions which stimulates observation and study among those who become authorities in judging and cultivating any class of flowers. They not only take pleasure in noting all the varietal peculiarities of their chosen flowers, but others learn from them, and it is to specialists, after all, to whom we look for the advancement of horticulture in all its branches.

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TABLE OF CONTENTS.

EDITORIAL ARTICLES:—The Boundaries of Yellowstone Park.....	241	PA 718.
The Management of Cemeteries.....	241	
The Cork Oak.....	Charles Naudin. 242	
The Morningside Plateau, New York.....	243	
NEW OR LITTLE-KNOWN PLANTS:— <i>Viburnum cotinifolium</i> . (With figure.).....	C. S. S. 243	
New Orchids.....	R. A. Rolfe. 243	
<i>Begonia Gloire de Lorraine</i> . (With figure.).....	244	
The Grape "Proligère de Varna".....	Ed. André. 244	
FOREIGN CORRESPONDENCE:—Forest Hill Nurseries.....	Visitor. 245	
CULTURAL DEPARTMENT:—The Loss of Vigor in Varieties of Strawberries,		
<i>Professor E. S. Goff</i> , 246		
Cultivation for Health.....	E. P. Powell. 248	
Plum-flower Blight.....	Professor Byron D. Halsted. 248	
<i>Aquilegia Stuartii</i>	E. O. Orpet. 248	
Notes on <i>Forsythias</i>	J. G. Jack. 249	
Lilies-of-the-valley, <i>Primula cortusoides</i> , <i>Iris cristata</i> , <i>Begonia Vernon</i> ,	J. N. G. 249	
THE FOREST:—The Profitableness of Forest-culture.....	B. E. Fernow. 250	
CORRESPONDENCE:—The Winter-killing of Conifers.....	H. H. Hunnewell. 250	
Rose Sports.....	C. R. 251	
Sweet Alyssum.....	Mary F. Harman. 251	
The Flowers of <i>Euphorbia</i>	Nathaniel T. Kidder. 251	
NOTES.....	251	
ILLUSTRATIONS:— <i>Viburnum cotinifolium</i> , Fig. 47.....	245	
<i>Begonia Gloire de Lorraine</i> , Fig. 48.....	247	

The Boundaries of Yellowstone Park.

IT is hardly safe to prophesy what this Congress will do in regard to the boundaries of Yellowstone Park, but the situation just now is this: In the House of Representatives Mr. Stockdale's bill, which is in the interest of the so-called Montana Mineral Railway Company, and gives them the exclusive privilege of using the park as a railroad thoroughfare, has been favorably reported, and is now on the calendar. The Senate has passed the bill presented by Mr. Warren. This cuts off a small portion of the park north of the Yellowstone River in order to give facilities for building railroads to Cook City without invading the park territory, and it adds to the park some 1,200 square miles, although the addition does not include more than one-half of the forest-reservation which was set apart by the President, while the portion of the reservation not included in the park is restored to the public domain. We should prefer very much the original bill of Senator Vest, which included within the boundaries of the park the entire reservation made by the President, but even Senator Vest was induced to vote in favor of the Warren bill as probably the best compromise which could be secured.

The debate on this bill, as reported in *The Congressional Record*, furnishes some instructive reading. Senator Vest stated, with considerable humiliation, as he said, that he had found after a struggle of twelve years that a persistent and unscrupulous lobby is able to do almost anything it pleases with the public domain, and he expressed the fear that this lobby "would not permit" even the passage of this Senate bill. One would naturally suppose from this that the promoters of this railway scheme comprised a large body of citizens with extensive political and pecuniary influence. On the contrary, it was stated in the debate that this so-called company had never had a meeting; that no books were ever opened for the subscriptions to its capital stock; that it has never made a report; that it has never

built a rod of railway; that under the laws of the state of Montana all its supposed rights were forfeited long ago; and finally, that all these people desire is to obtain a franchise from Congress for the purpose of selling it to the Northern Pacific Railroad Company. Evidence seems to have been submitted to both Houses of Congress which fully justifies these charges against an unscrupulous band of adventurers. Senator Vest declares that they have been able to block all legislation relating to the park simply because they are a compact organization, like an army, persistent, aggressive, untiring and determined to capture this charter and make money by its sale. On the other hand, the friends of the park are few and apathetic, without any co-operation and no influence with either great party, because there are no votes in the Yellowstone either for Republicans or Democrats or anybody else. Senator Sanders, in alluding to these statements of Senator Vest concerning the lobby and its power, added that the Senator from Missouri "had spoken with moderation."

Even if these statements were somewhat exaggerated, it seems to plain people who are not members of Congress that there ought to be sufficient virtue in the House of Representatives, when such facts are brought to the attention of its members, to defeat this Mineral Railway job; and we again call upon all those who are interested in forests and forestry, in natural beauty, and in the good name of the country, to make personal appeal to their Congressmen to vote and work against this Stockdale bill. Senator Warren's bill is not all that is desirable, but certainly it is better than nothing. The twelve-mile strip added to the eastern side of the park is more heavily wooded than the part rejected, and it contains the headwaters of all the streams which run into the Yellowstone River and Lake, besides the sources of the Stinking Water River. It is a misfortune that the portion of the reservation on the south, lying west of the Snake River, is cut off. There are some moose here, although the principal breeding-grounds for great game are east of the Snake River. In our judgment the new states make a mistake in permitting these mountain-regions to pass under private control, but no law which is opposed by the Senators and Representatives of these states can be passed, and the fact that the Warren bill is supported by the Senators from Idaho, Wyoming and Montana gives some encouragement to hope for its passage in the House. The surrender of a few square miles in the north-east corner is no serious loss, since it leaves a good natural boundary for the park and makes an opening for railroads, which will leave no excuse for any further raids for right of way through the park by speculators. Finally, if this Senate bill passes the House, the boundaries of the park will be fixed with some certainty for years to come, at least, and until these boundaries are permanently established the park will be threatened with invasion of one kind or another constantly. As the people learn to appreciate this region, and become familiar with its uses and value, the next change demanded in its boundaries will probably be a further enlargement of its area.

The Management of Cemeteries.

IT seems to be a pretty general belief that in almost every field of human effort demand precedes supply. But in matters where a refined public taste is concerned the supply of good work precedes and creates the demand. For many years the best pictures produced by American artists have not been those which sold the best, and, of course, those which sell the best most truthfully represent the condition of the public taste. Again, our appreciation of the best foreign works of our time has been largely due to dealers who imported the pictures of such men as Corot, Rousseau and Daubigny before we even knew their names, and long before we could understand and properly estimate their art. It is true that in the long run dealers may have profited by this experiment, but the public has profited by it far more, and it is just that we should feel grateful to

them as to unselfish benefactors. What we wish to do now, however, is to call attention to another illustration of this truth which has been suggested by the published report of the *Proceedings of the Convention of the Association of American Cemetery Superintendents*, which was held last autumn in Chicago.

To some eyes there may seem no hint of artistic things or questions in this title. But our readers are aware that we consider the right treatment of the rural cemetery, an institution which is almost peculiar to America, rests on important and interesting artistic principles. And yet it is evident from this report that the greatest obstacle in the way of such treatment is the persistent bad taste of the public. We might suppose that our cemeteries are not more beautiful because it is hard to find people to make them beautiful. But the case is really the reverse of this. Many at least among the persons who are employed to care for them know what aspect they ought to wear, and are eager to give them this aspect; but their employers bar the path. If the bad taste of the committee or trustees who control a cemetery is not to blame, then it is usually the bad taste of the majority of individual lot-owners.

Of course, we should not assert this simply on such statements as that "the superintendents of cemeteries have to bear with many things that they do not like in catering to the public." If no explanations with regard to points of difference were given, we might conclude that the superintendents rather than their patrons need an education in good taste. But the various addresses given at length in this report bear such clear witness to the correctness of the views of prominent cemetery superintendents, and to the conflicting views of their patrons, that one cannot help feeling confident as to the source from which improvement may be expected.

For example, Mr. G. H. Scott, of Rose Hill Cemetery, Chicago, in discussing how large a part nature should play in the cemetery, said: "What may be considered natural in a cemetery? In the first place, grass and trees. There should be an abundance of grass and a sufficiency of trees and shrubs, with as few pathways as possible and no more driveways than are absolutely necessary. A cemetery-lot with mounds or graves not higher than three inches above grade of plain sod, well clipped and trimmed, gives that appearance of neatness, simplicity, quiet and beauty which every such lot should have. The prevailing anxiety on the part of lot-owners to surpass each other in the erection of costly monuments, vaults and stone-work generally, is detrimental to the natural appearance of a cemetery. Another encroachment upon the natural appearance of a cemetery is carpet-bedding. To take the natural and well-trimmed sod from a grave and cover it with a carpet-bedding of plants and flowers, giving it the appearance of a patch-work crazy-quilt, is, to say the least, absurd, and certainly not in keeping with the natural appearance of a cemetery representing the peaceful resting-place of the dead. Not so with plants of wild flowers and hardy herbaceous perennials. They are things of nature. This class of plants are inexpensive, will live over winter, flourish without care, become larger in size and increase in beauty every year, and should be dispersed over the ground so as to give them a natural appearance. A cemetery should be a place for meditation, a place where the living, pleased and satisfied with its natural appearance of peace and quiet, and free from the busy hum of human toil and artistic dazzle, may anticipate the time when they, too, must succumb to the inevitable, not mournfully, but cheerfully. Besides, if cemeteries generally were kept more natural in appearance, their cost of maintenance would be less."

We have taken these sentences out of their context and massed them so as to show, as briefly as possible, Mr. Scott's idea of what the treatment of a rural burial ground should be. And from the speech of Mr. Higgins, of Woodmere Cemetery, Detroit, we may take a few more sentences with a similar purpose. "What," he asks, "are the essentials of a perfect cemetery? Beauty and harmony. Har-

mony, as I here use it, should not be considered as flatness or want of variety, but as a lack of elements of discord which it is difficult to overcome. Thus a small Niagara would not be desirable in the proposed site for a burying-ground, neither beetling cliffs nor wild gorges. Picturesqueness may occasionally be properly sought after in the improvement of parks or private grounds, but is scarcely productive of that air of quiet repose which should be one of the main characteristics of the last resting-place of man. . . . The two crying evils of all cemeteries are our present great ugly headstones and our unsightly grave-mounds. It seems to me, however, that in some cemeteries which are working toward the lawn-plan, they lay too much stress on prettiness and bring with it the puerilities, polish and showiness of highly kept front yards or showy lawns, and that too much money is expended in ornamentation and display. Now, neatness is one thing, display an entirely different thing. I believe that the nearer we keep to nature in our methods of cemetery improvement, the better results we shall obtain and the more economical will be our management of affairs. We must bear in mind that cemeteries are designed for burying-places for the poor as well as for the rich, and that extravagance in ornamentation or wasteful methods of care defeat the very purpose for which they were intended."

Surely these ideas are sound. They are the truly artistic because the truly fitting principles in accordance with which rural burial grounds should be designed and maintained. It is pleasant to know that persons holding executive positions in our cemeteries entertain such ideas, and we should be glad to know that they were less frequently hindered from acting upon them by their employers.

The Cork Oak.

A SUBSCRIBER in California has asked us for information with regard to the cultivation of the Cork Oak, and being unable to find anything satisfactory on the subject published in works of European silviculture, we addressed the question to our learned correspondent, Monsieur Charles Naudin, of Antibes, in France, who sends us the following reply:

The Cork Oak, like the Chestnut, is only found on sandy soil, and grows in forests in Provence, in Roussillon, Corsica and Algeria. It is not cultivated, although owners of sandy soil sometimes sow the acorns on ground from which forests of this tree have been removed, but their operations are confined to planting the acorns, and nothing is done to the trees until they are old enough to produce a crop of bark. It is believed, however, that it will be a profitable operation to pay some attention to the young plantations, especially to clear them of other trees and shrubs and to prune the trees in order to hasten the development of their trunks. It is customary to find Cork Oaks mixed with other trees—Pines, Ilex, Chestnuts, etc.

From the classical *Quercus suber* the botanist Jacques Gay separated as a distinct species, under the name of *Q. occidentalis*, a variety with very thick corky bark peculiar to south-western France outside of the Mediterranean basin, which he distinguished from the ancient *Q. suber* by the biennial ripening of the acorns, but this character is so little constant that botanists have not considered this form specifically distinct, although, and this is worth noting, it is much hardier than the Mediterranean form. Fifty or sixty years ago, Monsieur Trochu, father of the General of that name, made plantations of the two Cork Oaks on Belle Isle, on the coast of Brittany, in an oceanic climate. The Oak of the south-west flourished here while those from the shores of the Mediterranean all perished. This seems to indicate a specific difference, or at least a physiological difference. I do not doubt that the Mediterranean Cork Oak will succeed in California if it is planted in sandy soil; at any rate, it would be interesting to try there the two species, or the two varieties, in order to judge by comparison which is the more valuable.

Speaking of Oaks, an old forest-officer, Monsieur Bouguet de la Grye, tells me that *Q. Banisteri* (*Q. ilicifolia*) of the southern United States produces great quantities of acorns. If it really possesses this quality it should be introduced into Algiers, where the acorns would serve as food for pigs.

The Morningside Plateau, New York.

MUCH has been said of late about Morningside Park in this city and the various large buildings which it is proposed to erect in its neighborhood. But comparatively few persons, even in New York, understand what a great feature of New York these buildings and their surroundings may eventually become. The site and character of Morningside Park itself are pretty well known. The tract where the proposed buildings will stand is called Morningside Plateau, and extends from Morningside Avenue at the east, where it forms a high bluff overlooking the park, with a distant view of Long Island and the Sound, to Riverside Drive, which follows the brow of lofty banks of the Hudson. This commanding plateau extends north and south for nearly a mile and a half and varies in elevation from 110 to about 145 feet above tide-water level, and the only buildings which now stand upon it, with the exception of scattered cottages—relics of the time when the city was far away—are the Leak and Watts Orphan Asylum, the old De Peyster house, once a noted country-seat, and the Bloomingdale Insane Asylum. The presence of this last-named institution had, for more than a generation, deterred people from purchasing land in the neighborhood for private residences, and it was owing to the exertions of local property-owners, intent upon redeeming their possessions and bringing them into a profitable market, that the rugged tract along its eastern skirts was set apart for public use and transformed into a pleasure-ground.

Then, several years later, the ground owned by the Orphan Asylum was purchased by the trustees of the proposed Protestant Episcopal Cathedral, and at about the same time the property-owners, determined to get rid of the Insane Asylum, induced the Legislature to pass a bill opening One Hundred and Sixteenth Street, through to the river. This action induced the governors of the New York Hospital, which owns the Insane Asylum, to decide upon its removal to land purchased long ago at White Plains, and to offer its present site at public sale in lots suitable for private building. But then the trustees of Columbia College obtained an option on the entire property, and a bill, which had been introduced into the Legislature to provide for the cutting of another cross street through the plateau, was defeated in order that the college might have an undisturbed site of suitable extent. All indications point to the fact that work on the cathedral will shortly be begun; and there is likewise no doubt that Columbia College will soon raise the money needful to purchase the land now reserved for it and erect a fine group of buildings.

The Cathedral Parkway will be a wide avenue crossing the southern end of this plateau on the line of the northern boundary of Central Park—that is, at One Hundred and Tenth Street—and from this point for the distance of three city blocks is the site of the future cathedral, while the new site for St. Luke's Hospital adjoins it on the north. A little farther north and west, between One Hundred and Sixteenth and One Hundred and Twentieth Streets, is the proposed site for Columbia College, and immediately north of this again, extending to the line of One Hundred and Twenty-second Street, is the proposed site for the College for Training Teachers. The space between the Boulevard and Riverside Drive is narrow, and, as a rule, somewhat sloping; so there will be a magnificent view from all these structures that are to be, while, if their architecture is what we may expect, they will vastly increase the attraction of the eastward outlook from the beautiful drive, forming, for a great part of its length, a background of stately buildings lifted above those on its immediate edge. Nothing, therefore, could be more fortunate for the city than this agreement between several very wealthy corporations to erect their buildings in this place; and, of course, the profit will not simply be the presence of these buildings themselves. Once the Insane Asylum is removed, the old prejudice against the plateau as a place of residence will vanish, and the existence of the ecclesiastical and collegiate groups will, indeed, bring it into the very highest esteem for this purpose. The value of any land within the borders of New York is and always will be too great for us to cherish the hope that building-sites, even in this locality, will be laid out on the generous scale which has been found practicable in other cities, especially in the west, and which adds so greatly to their dignity, beauty and individuality.

We cannot expect, even in the neighborhood of the grounds of the cathedral and of Columbia College, to find private houses surrounded by lawns and gardens of any great extent. But many recently erected buildings along Riverside Drive prove that it is possible for the wealthy, even in New York, to build houses which do not actually touch each other, and even

this much isolation gives the architect a great opportunity to improve upon the average New York house and secure both a greater degree of architectural dignity and a fuller expression of what we may call domestic personality. All the architects who have built along the drive have not used this opportunity well. Sometimes an effect of rampant ostentation has been secured instead of dignity and the home-like look which every private house, however large and costly, ought to wear; and instead of an artistic design we see one which is no more than artfully elaborate, or just as artfully and inappropriately rugged and rude. But as the years go on we shall learn more and more what true architectural elegance and true architectural simplicity mean. And as it will be a good many years before Morningside Plateau is covered with buildings, we need not doubt that it will eventually be a district in which New Yorkers can feel genuine pride.

It is interesting to know that when, about the year 1815, the New York Hospital found its city building too crowded for the accommodation of its insane patients and accordingly purchased the "Bloomingdale Farm," the price paid was \$4,000, although this farm was of greater extent than the property now owned by the institution, and that two years ago, when a hundred building-lots of ordinary size were cut off from this and sold, some of them individually brought \$4,000 in spite of the fact that they lay on still unopened streets. With the recent promise of the advent of the cathedral and the college, values have vastly increased again. Lots in the neighborhood of the asylum property could now be sold at from \$15,000 to \$20,000 each, and few owners are willing to sell at all.

New or Little-known Plants.

Viburnum cotinifolium.

THIS is a handsome shrub of Cashmere and the north-west Himalayas, where it is common at elevations of from four to seven thousand feet above the sea-level, and a near relative of the common Wayfaring-tree of Europe, *Viburnum Lantana*, from which it only differs in the dentation of the leaves and the larger limb of the corolla. It is a vigorous plant with stout stems, which attain a height of five to ten feet. The leaves are ovate or elliptical, obtuse or subacute at the apex, rounded, truncate or subcordate at the base, minutely crenulately serrate, stellate-woolly on the under surface when young like the young shoots, but ultimately nearly glabrous except on the lower side of the nerves, reticulate-rugose, dark green above, pale below, and about three inches long by two inches broad. The flowers, which open here by the end of May, are produced in dense thick-branched hirsute corymbs two or three inches across and generally terminal. The calyx is narrowly obconic, glabrous, with a short limb, the triangular lobes usually tipped with red. The corolla is white tinged with pink, shortly campanulate, the limb an eighth of an inch across when expanded, the spreading lobes as long as the tube. The drupe is oblong, compressed, a quarter of an inch long, bright red at first but ultimately nearly black; the seeds two-grooved on the back, and ventrally subconcave and three-grooved.

Viburnum cotinifolium (see page 245) was raised in the Arnold Arboretum, in 1881, from seed sent from the Botanic Garden of St. Petersburg and has proved hardy here with careful protection, although plants derived from other sources have not been able to bear the winter climate of eastern Massachusetts.

The size and the color of the flowers make it a handsomer plant than *V. Lantana*, which is, however, more vigorous and hardy here, and which will probably never be supplanted for general cultivation in the northern states by its Himalayan relative. C. S. S.

New Orchids.

DENDROBIUM BARBATULO-CHLOROPS, Rolfe.—A natural hybrid between *Dendrobium barbatulum* and *D. chlorops*, which flowered in the collection of Major-General E. S. Berkeley, of Southampton. It has the white flowers and general shape of the former, with the crest and light green side lobes of the lip of the latter. Both the species are natives

of the Deccan Peninsula, and grow together in quantity. Its appearance is therefore very interesting.—*Gardeners' Chronicle*, March 5th, p. 298.

PELEXIA TRAVASSOSII, Rolfe.—An elegant species, one of the prettiest of the genus, with white flowers lined with brownish red. The leaves are olive-green, with silvery nerves and a few white spots. It was sent from Brazil by Senor Travassos, and flowered in the Kew collection and elsewhere.—*Gardeners' Chronicle*, March 12th, p. 330.

CYPRIPEDIUM × BRYSA, Veitch.—A secondary hybrid raised from C. × Sedeni candidulum crossed with the pollen of C. Boissierianum, and said to be like a large form of the former, with a greenish tinge. Messrs. James Veitch & Sons, of Chelsea, received an award of merit from the Royal Horticultural Society for it on March 8th last.—*Gardeners' Chronicle*, March 12th, pp. 343, 344.

CYPRIPEDIUM × IANTHE, Veitch.—A secondary hybrid raised in the establishment of Messrs. James Veitch & Sons, of Chelsea, from C. × Harrisianum crossed with the pollen of C. venustum. It received an award of merit from the Royal Horticultural Society on March 8th last.—*Gardeners' Chronicle*, March 12th, pp. 343, 344.

DENDROBIUM DENSIFLORUM, var. CLAVATUM, Rolfe.—A distinct geographical variety from the Shan States, remarkable for its very clavate pseudo-bulbs, which taper to a very slender base. The flowers are white, with an orange-yellow lip. Its peculiarity may be due to the comparative dryness of the region it inhabits. It was imported by Messrs. F. Sander & Co., of St. Albans.—*Gardeners' Chronicle*, March 26th, p. 394.

CYPRIPEDIUM CALCEOLUS × MACRANTHOS, Barbey.—A natural hybrid between C. Calceolus and C. macranthos, imported from the Birch-forests of western Siberia, where the two species grow intermixed. It flowered with Monsieur Barbey at Valleyres. It is precisely intermediate in character, as the flowers are smaller and paler in color than C. macranthos, with all the organs of the flower modified in the direction of the other parent. It is specially interesting as the first natural hybrid in the genus.—*Gardeners' Chronicle*, March 26th, p. 394.

PELEXIA WENDLANDIANA, Kranzlin.—A species, remarkable for its long filiform sepals, which appeared in the collection of Monsieur Wendland at Herrenhausen. It bears a raceme of about twenty greenish brown flowers, with a white lip.—*Gardeners' Chronicle*, April 2d, p. 426.

CYPRIPEDIUM × CLEOPATRA, O'Brien.—A secondary hybrid raised in the collection of C. Winn, Esq., of Birmingham, from C. Hookeræ crossed with the pollen of C. × oenanthum superbum. It has the general characters of the mother plant, but modified in the direction of the other parent, especially in the purplish crimson coloring of the upper half of the dorsal sepal and the outer halves of the petals.—*Gardeners' Chronicle*, April 9th, p. 458.

CALANTHE VESTITA, var. FOURNIERI, Rolfe.—A well-marked geographical variety, imported from Borneo by Monsieur Fournier, of Marseilles. The flowers, which vary from pure white and blush to deep rose-pink, are smaller than those of the type, while the pseudo-bulbs are constructed in the middle, like those of the variety Turneri. It recently flowered with Messrs. F. Sander & Co., of St. Albans.—*Gardeners' Chronicle*, April 16th, p. 488.

CYPRIPEDIUM × LAWREBELLUM.—A hybrid raised in the collection of Sir Trevor Lawrence, Bart., M. P., from C. Lawrenceanum crossed with the pollen of C. bellatulum. The flower is intermediate in shape, the color rich rosy crimson, with a tinge of green at the base of the sepals and petals, a pure white margin and some purple-brown lines on the upper sepal, and some chocolate spots on the petals. It was awarded a first-class certificate by the Royal Horticultural Society on April 12th last.—*Gardeners' Chronicle*, April 16th, pp. 502, 503; April 30th, pp. 560, 561, fig. 82.

DENDROBIUM × ADRASTEIA, Veitch.—A hybrid raised from D. Pierardii crossed with the pollen of D. superbum. The sepals and petals are pale pink and the lip primrose. It was raised by Messrs. James Veitch & Sons, of Chelsea,

and exhibited at a meeting of the Royal Horticultural Society on April 12th last.—*Gardeners' Chronicle*, April 16th, p. 503.

LÆLIO-CATTLEYA MARRIOTTIANA.—A hybrid raised in the collection of Sir William Marriott, of Blandford, between Lælia flava and Cattleya Skinneri. It bears upright spikes of yellowish pink flowers, the younger ones having a brownish tint. It received an award of merit from the Royal Horticultural Society on April 12th last.—*Gardeners' Chronicle*, April 16th, p. 503.

Kew.

R. A. Rolfe.

Begonia Gloire de Lorraine.

THIS is the name given to a new winter-flowering Begonia raised by the Messrs. Lemoine from B. Socotrana, as the seed-parent, and B. Dregei, as the pollen-parent. The seeds, which ripened in February, 1891, were sown at once and came up in the spring. The young seedlings began to flower about the middle of November and are still in bloom. Although B. Socotrana is bulbiferous and B. Dregei tuberous, the hybrid forms neither tubers nor bulbets, but the base of the stem is throwing out many shoots, which will insure the rapid multiplication of the plant.

The leaves are rather small, nearly regular, of a clear green; the flowers almost exclusively male, with four petals, are large, and borne in broad panicles, covering the whole superior part of the plant. They are of a fresh rose color, and, being not deciduous, remain a very long time on the plant. This novelty (see page 247) was exhibited in February before the National Horticultural Society of France, in Paris, and was awarded a first-class certificate with a special mention, and it is highly commended in the French horticultural journals. It is probable that older and stronger plants will make admirable specimens.

Grape "Proligère de Varna."

THIS Grape already forms the larger part of some of the vineyards about Varna, France. It is native to the shores of the Black Sea, and appears to be quite variable. There are already several distinct varieties grown in the vineyards of Varna, some of them being excellent for table use. The grape makes a red wine of fairly good quality, but it could undoubtedly be much improved. The most interesting feature of the Grape is its productiveness, and it is this which suggested the name Proligère de Varna. Instead of bearing only two or three bunches upon every shoot, as most Grapes do, it has from four to eight. One might almost say that every tendril is transformed into a grape-cluster.

The plant, as growing in the vineyards, may be briefly described as follows: The canes are very vigorous and attain a length of several metres; they are commonly cut back. The wood is yellowish red, downy; internodes of unequal lengths, longitudinally grooved; buds large, white, pubescent. Petioles robust, cylindrical, tomentose, reddish brown, and from seven to eight-centimetres long. Leaves orbicular, thirteen to fifteen centimetres in diameter, the central sinuses of the lower ones oval and almost closed, those of the upper leaves being considerably larger, dentate, the teeth short, strong, mucronate; the lower surface pubescent, veins prominent; upper surface glabrous, but not glossy, showing a net-work of fine non-protruding veins. Clusters three to eight upon each shoot; peduncles green and red, short, very strong. The lower clusters are ten to fifteen centimetres long and quite compact; the upper ones are smaller, more open, and sometimes bear a tendril. Pedicels short (four or five millimetres), rugose, the inner extremity slightly enlarged. Berries almost spherical or slightly oblong, the longitudinal diameter being sixteen millimetres, the transverse fifteen millimetres; color a uniform black; skin moderately thick and rich in tannin; flesh deep grayish red, sweet and piquant to the taste. Seeds greenish brown, rounded, not rugose.—*Ed. André, in Revue Horticole.*

[No doubt this Grape would flourish in California, and it would be worth testing in the southern Atlantic states. Even if it is nothing more than a variety of *Vitis vinifera*, it is sufficiently distinct to suggest to hybridizers the idea of crossing it upon some of our native species.—*Ed.*]

Foreign Correspondence.

Forest Hill Nurseries.

THE nurseries of the well-known firm of Messrs. J. Laing & Sons are about eight miles from St. Paul's Cathedral, and two from the Crystal Palace at Sydenham. They were founded by the veteran John Laing about forty years ago, and they are now famed for tuberous Begonias, Gloxinias and Caladiums, which have been a speciality with

long by fourteen feet in width, low, span-roofed, with a low fibre-bed on one side and a cinder-bed on the other side of the path. The sun shone full in upon the plants, and the temperature was that of a moist stove. Laing's Begonias are always first-rate, but those I saw the other day were certainly far finer than any I have ever seen. One house contained single-flowered varieties. They were in nine-inch pots, planted in yellow loam, manure and plenty of sand, and they had been started in January. Many of the plants were a yard across, with leaves often a foot long and



Fig. 47.—*Viburnum cotinifolium*.—See page 243.

Messrs. Laing for many years. The tuberous-rooted Begonias are grown there better and in larger quantities than anywhere in England. Mr. John Laing, indeed, may be called the originator of the Begonia cult, as he was one of the first to set to work in earnest to breed improvement into these plants, and he has done far more to make the Tuberous Begonia what it now is than any other breeder, professional or amateur. I was invited last week by Mr. Laing to inspect his first batch of Begonias in flower. These were in two large houses, each one hundred feet

half as broad, very thick and succulent, pictures even without the flowers, and the flowers were simply marvelous, both in regard to size and colors. Flowers four inches across were numerous; there were also many kinds which, while having only medium-sized blooms, were elegant in form. The florists' ideal flower, round and flat as a saucer, was represented, too, and was pointed out with pride by Mr. Laing, who remarked that, although they were not every one's choice, yet the florist had to be considered, and that it was only when aiming for his ideal that good things

of all kinds were obtained. All these magnificent plants, robust in habit, large in flower and rich in shades of color, had been selected from the fields of seedlings which in this nursery are raised every year and planted outside in June. The best of them are named, but, says Mr. Laing, "we get on so fast and improve so every year that the choicest of last year are only second-rate compared with those of this."

In the other house all the plants were double-flowered, and these were even more astonishing than the single-flowered ones. "We are aiming now to get erect-flowered double varieties. Hitherto they have had the drawback of being too weak in the stalk to bear the weight of the heavy double flowers, so that they looked 'floppy.' But, see," said Mr. Laing, "we are getting on." And sure enough there were plants, large and full of flower, all holding their big Carnation-shaped blooms perfectly upright without the support of stake or tie of any kind. "We shall in time, if we care to, get the stalks so short and stout that the flowers will all hold up their heads like *Cinerarias*." *Begonias* have proved exceptionally plastic in the breeders' hands. It is scarcely credible among outsiders that the best of the seedlings we now possess are the progeny of several Andean species of *Begonia* which were almost unknown twenty years ago, and the flowers of which, compared with the huge blooms of some of Mr. Laing's latest seedlings, are as a Wellington apple is to a crab.

The named kinds which I made special note of were Princess May, a pure white, double, perfect in form, large and full; "the best white yet," Mr. Laing said. It has just returned from an exhibition at Regent's Park, where it had been awarded a first-class certificate. Lady Theodore Guest, another big double-flowered seedling, was remarkable for its wavy petals, colored buff, tinged with salmon. Mrs. Regnart, with full chrome-yellow flowers as large as a child's fist, had also received a certificate.

The best of the new erect-flowered double sorts was one named Baron Schröder. The blooms were fully three inches in diameter, very double, perfectly erect and colored a rich orange-scarlet. Perfection was another plant with stem erect and a large double flower colored rosy scarlet. Baroness Burdett Coutts had semi-erect flowers, large, wavy, and colored a soft pale salmon. Another pretty variety was named Mrs. Coomber; it had Picotee-like flowers, colored creamy white with a rosy edge.

Mr. Laing says he has a great display of *Begonias* from April till October, and that he could have it all the year round with a little management. The two houses described were the "show-rooms" merely; the "work-shops" revealed how the thing was done. Long low houses and frames were filled, or being filled, with boxes of recently pricked off seedlings, a dozen or so young lads, fresh from the board-schoolmaster, being seated round a big bench pricking the little plants off. The boxes used were fifteen inches by nine and two inches deep. Forty plants were put into each box, of which ten thousand at least would be filled this year. The frames were placed upon hot-beds of manure, with a thick layer of spent hops spread over the top of the manure. "Nothing like hops to keep down the fly and make the seedlings shoot along," said Mr. Laing. "What becomes of them all?" I asked. "Why, bless you," said he, "they don't stay with us long; we can easily find customers for all we grow."

The work of selection and crossing, which Mr. Laing does himself, is conducted in the houses in which only specially good varieties are grown, so that in the event of stray pollination not much harm is done. Mr. Laing informed me that the very best kinds are obtained from seeds, and that, except in very few cases, it is scarcely worth while to propagate the plants from cuttings.

The *Caladiums* are second only in interest to the *Begonias*. Some of the varieties are gorgeous in color, and the leaves as large almost as umbrellas. Messrs. Laing grow *Caladiums* better than any one in London, their groups at the great exhibitions being far ahead of every other exhibit of the same kind. I noted down the

best, to my taste, of all the *Caladiums* I saw there among the hundreds of named varieties grown. Mrs. Harry Veitch has large broad leaves, blush-white, with the midrib and larger veins colored rich crimson; John Laing has equally large leaves colored bright rose-red, with a creamy white border; *Reine de Danemark* is colored delicate rose with carmine veins, and netted all over with green; *Maria Mitjana* is almost wholly rich rose; *Madame Marchand* has grand leaves, colored rosy carmine, margined with dark green; *Aurore Boreale* is deep red, lined with carmine and blotched with a peculiar metallic green; *Chactas* has large deep red leaves with green borders; *Raymond Lemoigner* has a creamy white centre, a rich red outer part, very large leaves, and is a magnificent variety: P. S. Williams is deep rose, with carmine-red veins; *Candidum* has white leaves, with very conspicuous green ribs; *Bellone* is rosy colored in the centre, red-maroon toward the margin, and tinged with brown; *Leopold Robert* has a beautiful leaf, colored blush-white, with a rich green border and carmine-red ribs; *Gaspard Crayer* has a red centre, with a broad border of deep green blotched with red; *Ornatum* has a grass-green ground, with carmine ribs and crimson veins; *Charlemagne* has large rosy red leaves, with dark red veins; *Madame M. Scheffer* has large white leaves, with rosy ribs, veins and margin. These sixteen varieties are remarkable for the large size of their leaves, their exceptionally brilliant colors and delicate tracery. They are not all Mr. Laing's first favorites, but they are what I would select for myself. The cultivation of these plants is not at all difficult, and yet there are very few growers who can produce anything like the grand specimens which come from Forest Hill. Here are the details of culture for them as recommended and practiced by Messrs. Laing:

Caladiums are easily managed. They require a good moist heat to develop their beauties, and a fair amount of shading at the commencement of the season, as in some instances the texture of the leaf is thin, and, unless carefully shaded from the sun, the glass is apt to burn the foliage, and thus permanently disfigure it; but avoid too heavy shading and too much heat, as this encourages flimsiness and thin foliage. The bulbs should be potted when growth commences in spring, and a compost of two parts peat, one part turfy loam, one part silver sand, and plenty of drainage, and placed in a brisk bottom-heat, with a moist temperature of seventy degrees, and, with frequent potting, they will soon make large plants. Care should be taken not to water very liberally until the pots get well filled with roots, and then, if required, apply liquid manure regularly. Syringing is beneficial.

For ordinary purposes, bottom-heat to start them is quite unnecessary, but a light position near the glass is of more importance, and is at all times essential. The plants in summer, before being removed to cool houses, should be hardened for a week in a less warm house than the stove, otherwise much of their beauty will go before they get used to the change.

When their beauty begins to fade, gradually dry them off by giving them less water, but on no account should the soil be dust-dry all the winter, or when starting-time arrives the bulbs may be found to have disappeared from the "dry-rot" disease.

The Forest Hill Nurseries are not devoted only to a few things, for there is also a good collection of Orchids, stove and greenhouse plants and fruit of all kinds.

London.

Visitor.

Cultural Department.

The Loss of Vigor in Varieties of Strawberries.

THE marked decline of the Wilson Strawberry during recent years is well known to all who have been familiar with this fruit as grown in this country during the last two decades. Yet a few growers, among whom may be named Mr. J. M. Smith, of Green Bay, Wisconsin, continue to have excellent success with this time-honored variety. Indeed, Mr. Smith claims that no recent variety among many he has tested fully equals the Wilson in yield. He has long ascribed his success with the Wilson to the fact that he invariably takes his plants for setting from beds set the preceding spring, and which have not borne a crop of fruit.

Certain experiments that I have been making lead me to

believe that Mr. Smith is correct in this reasoning. The results of these experiments seem to show that the so-called "spot disease" or blight of the strawberry, caused by the fungus *Ramularia Tulasnei*, may produce an enfeebled condition of the plant from which it does not rally for at least several generations. It is well known that the Wilson Strawberry is very subject to this disease, but that plantations do not often suffer much from it until the year after planting.

In the spring of 1889 Mr. Smith kindly sent me fifty plants of what he thought his most vigorous Wilson strain. These were divided into two lots of twenty-five plants each, and

favorably located, hence I can ascribe no other cause for the failure of this bed than the disease from which it has suffered.

In order to test the validity of Mr. Smith's theory, as noted above, I have been careful to plant each spring a new bed of young plants taken from the bed set the previous spring, and which consequently has not borne a crop. With these I have been comparing other beds formed of young plants from the diseased bed mentioned above, and also from other beds that, while not especially diseased, had borne at least one crop of fruit. I have endeavored to secure a comparative record of yields from these plantings, but as the exact number of healthy



Fig. 48.—Pagonia Gloire de Lorraine.—See page 244.

planted in two small beds about four rods apart. Both beds did well during the first summer, and yielded a good crop of fruit in 1890. But after the fruiting season, one of these beds was badly affected with blight, while the other, from some unknown cause, was nearly or quite exempt from it, and the same was true in the summer of 1891, the same bed being free from blight both seasons. The result is that but forty-four plants in the diseased bed have survived the past winter, while 234 plants have survived in the other bed. If there is any difference in the environment of the two beds, the one that has suffered so badly from blight would seem to be the more

plants in the different beds was not noted at the time the fruit was gathered, the figures based on crop alone might be very misleading. It will be more just to compare the vigor of the different plantings by noting the number of surviving plants at the present time. I may add, however, that the differences in yield, so far as ascertained, are quite as conspicuous as are those of plant production.

Last spring a bed of sixty-five young plants was made, the plants being taken from a bed set the previous spring, and which had been set in the spring of 1890 from the healthy bed grown from Mr. Smith's plants set in 1889. In other words, the

ancestors of these sixty-five plants had been free from disease and had not borne a crop, at least since 1888, and, as Mr. Smith affirmed, for many years previous. This bed now contains 332 strong plants, besides some others that have suffered from the winter, or a fraction over five and one-tenth plants to each one set last spring. It should be remarked here that August and September of last season were the driest I have ever known, which explains the meagre growth of plants. Twenty-six young plants from the blighted bed above mentioned were set last spring in two short rows adjoining the sixty-five plants just mentioned. The vigor of this blighted bed had become so much reduced that a larger number of young plants could not be obtained; these twenty-six plants are, therefore, from parents blighted severely for two generations, and yielding a crop of fruit the summer previous. But forty-three plants have survived the winter from this bed, or a little less than one and seven-tenths plants to each one set last spring.

Another small bed of thirty-nine young plants was set last spring adjoining the one just mentioned. For this the plants were taken from a bed that was set in 1889, and hence had borne a crop of fruit but which had not suffered much from blight. In this bed a fraction less than four plants have survived the winter for each plant set. Recapitulating then, we have:

Plants with ancestry free from disease, and not weakened by bearing, five and one-tenth surviving plants for each plant set.

Plants with ancestors suffering from disease two preceding generations, and further weakened by bearing, one and seven-tenths surviving plants for each plant set.

Plants with ancestry nearly free from disease, but having borne one crop of fruit, four surviving plants for each plant set.

It may be added that the above three lots of plants were all set on the same day and have received exactly the same treatment.

It will hardly be denied that the differences of vigor manifested in the above plantings are greater than we should usually expect from different varieties of the Strawberry similarly treated. The lesson seems clear enough. It is unwise to plant a new Strawberry-bed from a plantation that has suffered from the attack of *Ramularia*. The young plants from such a bed, whether they develop the disease or not, are reduced in vigor, and are not likely to prove satisfactory. I ascribe Mr. Smith's fine success with the Wilson Strawberry more to his having always grown his plants from parents that were free from disease, than from the fact that they had not been permitted to bear.

It seems not improbable that in fruits like the Strawberry better results may be gained through methods which aim at promoting the vigor of the varieties we already have, than in continuing the production of new seedlings, the method of improvement usually adopted.

Wisconsin Experiment Station.

E. S. Goff.

Cultivation for Health.

THE notes from Colonel Pearson in a late number of GARDEN AND FOREST touch a question of importance in several directions. He planted Potatoes on poor soil, where they made but feeble growth, and near them he planted the same variety of Potatoes on soil enriched with nitrogenous manures; and the weak plants on the poor soil were attacked by insects and devoured before the others were touched—indeed, the strong plants were practically untouched. The same consequence followed when the blight appeared. The truth illustrated by this instance seems to be that insects and fungi, to a considerable extent, are in the habit of attacking and destroying vegetation already enfeebled or dying. My own illustration of the same truth occurred last year in a field where, of a dozen sorts, one variety stood green and untouched by beetles while every other kind was badly devoured. This was not owing to soil or fertilizers, for the same treatment was given to all sorts; and this exception was surrounded by others that were eaten. The two rows stood up as green as June in the middle of frost. What was the reason of this? My own solution is, that the exempted plants were of a new variety, a sport of Morning Star, that is exceedingly vigorous and does not blossom till September, nor mature till late November; in fact, it needs a season longer than I can give it. Planted together on the same date, the other sorts came up quickly and received a check from early frost; the tops were enfeebled. This new kind did not start up until after the frosts, and grew stoutly and steadily. The beetles attacked the feeble plants and did much mischief, just as they did in New Jersey.

The lesson, therefore, is to get a vigorous growth which has a resistive power against insects. Examine your house plants; if the aphid appears you may, as a rule, look for water-soaked roots or pot-bound roots or other cause of enfeebled growth. The bugs appear as nature's provision to turn sickly and sickening vegetable matter into non-deleterious animal matter. On a wider scale we may look on the bugs and worms in many cases as scavengers in our fields for our own good.

Healthy growth should be the ambition of cultivators. I do not mean to say that those destroyers that prefer unwholesome vegetation will not go farther and spread devastation over comparatively healthy foliage; but I was astounded at the appearance of the Potato I have mentioned. Plant a Cherry-tree in a dark and shady spot, and it will be loaded with the black aphid; and your Viburnums will, if set in shade, be covered with green aphides; while the same trees, if in open sunny spaces, are comparatively free. So far as our Potatoes are concerned the tendency of our system of cultivation is to enfeeble the plant. We plant small potatoes or small pieces which do not nourish the stalk well to begin with, and do not contribute to the health of the plant. The application of Paris green is also enfeebling. The growth in poor soils without food, as Mr. Pearson suggests, is in the same line of deterioration. Of course, there are insect hordes and plant pestilences which sweep everything before them, but the value of vigor as a protection against the attacks of disease and of insects ought to be more thoroughly appreciated.

Clinton, N. Y.

E. P. Powell.

Plum-flower Blight.

THERE is complaint that the flowers of Plum-trees are blighting badly. An examination of specimens thus affected shows that the blossoms, and particularly the flower-stalks, are brown instead of green, as they should be, and are covered with a gray mould. This mould is a fungus (*Monilia fructigena*) that frequently appears upon Plums, Cherries and Peaches later in the season, and most commonly when the fruit begins to ripen. The fungus is a rampant grower and will destroy a ripening fruit in a few hours, coating the decayed substance with a felt-like layer of spores.

In the case in hand the *Monilia* has come early while the crop is in the blossom state, and upon some trees no fruit will set because every flower is already mouldy, and all the flower-stalks are dead and covered with the spores of the fungus. Nothing can be done to save the fruit upon such trees, but it should be borne in mind that they are nurseries of a fungus the spores of which will find their way to other Plum-trees later in the season and induce a destructive decay. They may likewise seriously diminish the crop of the Cherry and Peach orchard.

Here is, therefore, an instance when spraying is important, not that the sprayed tree will bear fruit, but that the fungicide may save the fruit of other and more fortunate trees. Spraying one tree to save the crop upon another is practicable—it is, in fact, taking hold of the long end of the lever and using the ounce of prevention that often outweighs the ton of attempted cure.

Rutgers College.

Byron D. Halsted.

Aquilegia Stuartii.

THIS Columbine has been described as the most beautiful of all cultivated kinds, and as the plants are just flowering with us for the first time from seed, I wish to add my testimony to its excellence. Its parents are said to be *Aquilegia cœrulea*, a North American species, and *A. glandulosa*, which is of Siberian origin. The plant shows plainly by its very dwarf foliage the influence of *A. glandulosa*, but the flower-stems are longer than those of that species, although not more than eighteen inches high, while the flowers are large in proportion, being four inches across. The petals are dark blue and the centre white, so that in general appearance the flowers resemble a good variety of *A. cœrulea*, but the spurs are shorter. Taken altogether, *A. Stuartii* is an improvement on its parents, both of which have a rather doubtful reputation as good border-plants. *A. cœrulea* has a provoking way of dying after flowering, and sometimes before, and *A. glandulosa* rarely does well in gardens unless raised from seed and set out where it is to remain. Stuart's Columbine is probably the only authentic hybrid from *A. glandulosa*, the seeds of which differ from all others, being of a dull opaque black, and the seeds of *A. Stuartii* are similar, while the seeds of other Columbines are of a bright shining black. *A. Stuartii*, we believe, was raised in Scotland, and was first distributed by Mr. Wm. Thompson, of Ipswich, England.

It should be remarked, also, that this *Aquilegia* is very early in flower; there was no other species in bloom when it first opened, not even the native *A. Canadensis*, and now all other varieties will be sacrificed as they flower to be sure that seeds can be saved true. In this way only can *Aquilegias* be perpetuated by seed.

South Lancaster, Mass.

E. O. Orpet.

Notes on Forsythias.

THE Forsythias have blossomed with their usual profusion again this season, their bright yellow flowers giving us pleasure during nearly one-tenth of the year, for the earliest blossoms may be found by the middle of April, or soon afterward, and in a cool spring they will be preserved and continued for six weeks. Naturally we find the first flowers on the stems which trail on the ground, because there the buds first feel the effects of the sun on warm spring days.

The Forsythias bring up the much-disputed and never-ending question as to the correct names of the species or varieties, and there seems to be as much or more uncertainty to-day as to what form we shall get from a nursery, under any particular name, as there was ten years ago. All the variations may be divided into the two well-known characteristic forms—one a very long-branched, trailing, slender, pendulous shrub, the other with shorter, stouter branches, which are always erect, or only partially drooping. In certain situations we find plants of the first kind with less free-growing, vine-like, pendulous shoots, but this peculiarity appears to result from local conditions, and is not characteristic of the race. This pendulous species, which we know as *Forsythia suspensa*, is perhaps the most beautiful in flower because the most graceful when growing in a large clump or mass. In its best form it may be trained high up on a wall or allowed to grow naturally. In the latter case the long shoots grow until they bend over and the tips touch the ground, when they will form independent roots if the soil gives the least encouragement. In this way a single bush may eventually spread over a large area and form a mass composed of many individuals, but all from one parent—a sort of Walking Forsythia it might be called if compared with the habit of the so-called Walking Fern. One of the best botanical characters of the plant is that it has trifoliolate leaves, but these are often accompanied by single leaves on the same branch. In fact, simple leaves are most common on less vigorous shoots, while trifoliolate, deeply-toothed leaves are characteristic of more vigorous growths. They are usually ovate in outline.

The Forsythia of our gardens, which is the direct opposite of *F. suspensa* in habit of growth, is *F. viridissima*, with stiff, erect, unbending, bright green, four-angled stems, which apparently do not grow more than seven or eight feet in height, the average being somewhat less. Its leaves are never trifoliolate, but are simple, narrow, lanceolate, pointed, and evenly, but finely, serrated. An authority has described them as entire, but this is evidently a mistake. In this, and all the others, however, it will be noticed that the first lowest or outside leaves are smaller than the others, and are entire or without teeth on the margins. But these first leaves are mainly true bud-scales or coverings, of which there are two or three pairs, the inner ones having a distinctly accrescent character, growing into serviceable leaves. The tube of the corolla of *F. viridissima* is small, the petals narrow and of a deeper greenish yellow color than any other form, and the flower-stalks are shorter and with a decided curve downward. The blossoms do not appear here until fully a week later than any others. Between this stiff little species and the more graceful trailing *F. suspensa* we have the intermediate form or forms which give botanists some trouble to properly classify. *F. suspensa* is apparently also known as *F. Fortunei* in Europe, but the plant we are likely to get under this name in America is intermediate in habit between the two species mentioned, being of larger growth than *F. viridissima*, but without the slender trailing habit of the other, and without any trace of trifoliolate leaves.

The flowers, as a mass, usually have a deeper yellow effect than those of the trailing form, and they are individually not to be distinguished from them in size. The leaves are broader and shorter than those of *F. viridissima*, and their margins are much more deeply and conspicuously toothed. Any one planting a Forsythia for the sake of the beauty of the blossoms and a very free-flowering habit, would do well to select *F. Fortunei*, but if the graceful trailing habit is wanted it would not fill the requirements. It should be added, that this *F. Fortunei* is also sometimes sold as *F. viridissima*, in which case the purchaser is fortunate, for the last species, if true to name,

should never be selected in preference to the others unless space can be afforded for a collection of the various forms. The *F. Sieboldi* of some catalogues is merely another name for *F. suspensa*, and we have received at the Arboretum a *F. intermedia*, from German nurseries, which is hardly to be distinguished from the handsome erect form we know as *F. Fortunei*. It has been stated that some experimenters have grown both the *F. suspensa* and *F. viridissima* from the seeds of the former, but the two plants are so radically different that this hardly seems possible, and most probably there were mistakes somewhere. As the Forsythias are propagated by cuttings about as easily as Willows, there has been little inducement to raise plants from seed, but a series of seedlings from the different species or forms might be very interesting.

To the student of structural botany the efflorescence of Forsythia is interesting from the dimorphic character of the blossoms—that is, all the flowers of one plant will be found with long styles and short stamens, on another plant with short styles and long stamens—which facilitates their cross-fertilization by insects. It is of interest to note these differences, and in an examination of many plants in this vicinity we have found both the long and short styled forms among *F. suspensa* and also in the plant we know as *F. Fortunei*, but, so far, only the long-styled form in *F. viridissima*. The finding of both forms shows that the plants must have been originally derived from different seedlings, but our *F. viridissima* may all be the descendants of one original individual.

Arnold Arboretum.

J. G. Jack.

Lilies-of-the-valley.—These plants are forced into bloom and sold at so many seasons of the year that we are apt to lose sight of the fact that they are naturally flowers of May. At present nothing is prettier and more fragrant than their delicate bells nestling among the bold leaves. Naturally grown Lilies-of-the-valley have a beauty superior to those forced, though these flowers are acceptable at any time. There is always a demand for plants which can be grown under trees, and where the trees do not make an entirely dense shade, or where their gross surface-feeding roots are not fatal to any undergrowth, there are few things more satisfactory for such a position than Lilies-of-the-valley. An occasional thinning out and replanting of the crowns and a top-dressing of rich compost late in the season seem to meet their requirements in the garden. There is a noble variety of this plant of French origin known as Fortin. The specimens of this kind with which Messrs. P. Henderson & Co. favored me had grand foliage, but as they were spoiled in the forcing I am unable to say from experience whether the flowers are double the normal size as reputed. There is also a so-called rose-colored variety. This has small flowers, rather more constricted at the mouth than those of the type, and the color under glass entirely disappears. In the open the color is a rather feeble and unsatisfactory one.

Primula cortusoides.—This was lately mentioned as flowering in Massachusetts in April. It is seldom that flowers appear there before ours. My well-established plants are only now in full bloom; very satisfactory and graceful in flower in the border, but scarcely useful for cutting.

Iris cristata was noted last week as being in flower. This plant is too beautiful to dismiss without further mention, for, although a native plant and easily secured, it is one of our choicest border-plants. The foliage is very dwarf, only high enough to form a nest, filled and covered with large open lilac-colored flowers. It seems to me the most pleasing of all the dwarf true Irises.

Begonia Vernon (*B. semperflorens atropurpurea*).—As I may have unwittingly given a false impression of this plant last year, it may be well to note its behavior under exposure in the open. As stated before, the plants which had been kept under glass last year gave not the slightest sign of being other than a bright-flowered form of *B. semperflorens*. I transplanted them to a sunny border a few days since, and never beheld a more remarkable transformation in any plants. Within two days the deep green leaves began to take on bronzy and blood-stained tints of the most striking character, and the indications are that in this variety we have a new bedding-plant possessing many excellent points, easily and quickly propagated, bright, striking, showy and free-flowering, dark crimson usually. It should be a good wet-weather plant. Its ability to stand full exposure without scorching of the margin of leaves remains to be tested. It is certainly a variety worthy of trial.

Elizabeth, N. J.

J. N. G.

The Forest.

The Profitableness of Forest-culture.

AT a meeting of the Genesee Valley Forestry Association, held in the Chamber of Commerce rooms at Rochester on the 10th of May, an address was delivered by Mr. B. E. Fernow, Chief of the Division of Forestry, Department of Agriculture. The extracts which follow are taken from a report of this address in the *Rochester Union and Advertiser*:

PROFIT IN FOREST-PLANTING.—So far as forest-planting for profit is concerned, I counsel you carefully to scan your conditions before you stake your fortune in that direction. With soil otherwise useless, with low cost of stocking the ground, with no extra expense in watching and managing, and with a market not overstocked when your crop is ready for sale, you may find your plantation one of the best and safest savings-banks where a few thousand dollars can be invested with fair returns in the end.

Aside from the financial result, you will receive, of course, many benefits arising from the existence of the timber-lot which it would be difficult to express in dollars and cents, and yet which are tangible and enhance the value of the surrounding farm-land by making the place more sightly, by furnishing shelter to cattle and crops; by preventing erosion of the soil, if on the hill-side; and, if large enough, by equalizing the flow of springs and brooks and insuring desirable subterranean drainage. Nor does the well-kept timber-plantation need to mature in order to attain its value. Soon the prospective value will be fairly recognized, just as the calf and the colt have in them the promise of becoming a cow and a horse and are valued accordingly.

LOOKING FORWARD.—Although there is still plenty of virgin timber in the country, the time when it will be comparatively exhausted is drawing near. We have in the United States about 500,000,000 acres in woodland. If all of this were in good condition, with full-grown timber on it—which is far from being true—there could not be found on it more than 1,500,000,000,000 cubic feet of wood, which is at the rate of 10,000 feet b. m. of saw-timber per acre in the average. Since we use annually from 20,000,000,000 to 25,000,000,000 cubic feet of wood, of which 30,000,000,000 to 40,000,000,000 feet, b. m., is saw-timber, it appears that even with these extravagant assumptions regarding supplies we would exhaust them in sixty or seventy years, assuming that new growth is consumed by increased requirements. That this increase takes place may be learned from my computation, according to which the values of forest-products and wood manufactures during the census years 1860, 1870, 1880 and 1890 amount to \$300,000,000, \$600,000,000, \$900,000,000, \$1,200,000,000 respectively, or an increase of thirty per cent. for every decade; and since it takes at least sixty to seventy years to grow saw-timber—what we now cut is usually twice as old or more—it would appear that whoever invests his money in forest-culture to-day must be amply repaid by the crop, albeit his children will reap the profits really. Certain it is that it always requires time, and quite a long time, before the results of such management become visible, and that is largely why people are afraid to stake their money in the business.

GOOD ROADS AND FORESTRY.—One of the first requisites to make any producing business profitable is to have a market for the product and to be able to readily bring your product to market. Good and permanent roads are necessary to insure continuous profits in forestry as well as in agriculture. The disgraceful condition of the roads through the United States almost everywhere is not only detrimental to good morals, but also to the pockets of the farmer and of the consumer of farm-products. For profitable forest-management good, permanent roads are indispensable. Their money value may be judged from the experience of the little dukedom of Brunswick, where, without any other changes, the building of a rational system of roads through its forest-domain increased the income from the forest-management by twenty per cent. That forest-management pays in Europe may not any further help our argument than to assure us that it pays under certain conditions. The conditions are, first, a dense population, which makes a market for every stick of wood down to the merest brush; a well-established forestry system which it has taken centuries to build up; wood-lawns in good or fair producing condition as a result of this long application of rational management; skillful foresters, who manage the Government forests and give advice and good example to private owners. Many a farmer there finds his wood-lot the best-paying and

never-failing crop, and there are communities, towns and cities where, instead of paying taxes, a dividend is paid to the citizen from the surplus resulting from the well-managed woodlands.

STATE FORESTS.—In the Government forests the annual net profits range from \$4.11 per acre of forest in the highly cultivated and densely populated kingdom of Saxony to \$1.19 in mountainous Bavaria, where the Government forests comprise 2,300,000 acres, on which the Government spends \$3,130,000, and gets in return \$5,880,000, netting \$2,730,000 every year, and giving besides employment to a large force of men. In Prussia the net annual profit for every acre of woodland was at the rate of \$1.31 on 6,000,000 acres woodland, the expenditure last year being nearly \$8,800,000 for the administration, and with prices in the woods of \$3.00 per cord of fire-wood in the average, and \$10.32 per 1,000 feet b. m. of saw-timber the returns were over \$17,600,000, netting \$8,835,119, and this is continuous, ever-increasing revenue.

Why should not the state of New York, now owning as state property twice the area which little Saxony owns in woodlands, and proposing to acquire additional lands so as to make the area between that of Bavaria and Prussia's Government forests; why should not New York make its Adirondack forests, if not as profitable, yet fairly so, as those states have made their woodlands pay? There are really only two difficulties in the way—these are politics and private greed!

Otherwise, with, say, 4,000,000 acres set aside as a reserve, if only half that territory is in fair producing capacity an annual cut of 250,000,000 feet would be a low estimate, and under skillful management the annual growth would soon represent double that amount, assuring a handsome revenue in years to come, besides securing a state park for health, pleasure, hunting, fishing, preservation of water-flow and lumber-supply, and all without expense. To bring this about it is necessary to secure as soon as possible the acreage before it becomes more expensive, to place it under competent administration, to open up and make accessible the wilderness by a rational system of well-built roads, and inviting, not keeping out the railroads, under such restrictions, to be sure, as will properly guard the forest against danger from fires; for accessibility is the keynote of practicable and profitable forest-management.

The lumberman can then be satisfied by selling the logs, the friend of nature will find plenty of opportunity to enjoy himself, the game will find the protecting thicket, which is now unknown, and the forest-cover, instead of decreasing, will be increased in density and quality under the skillful use of the axe by the forester. But the profitableness of forest-management in the Adirondack, like that of the wood-lot on the farm, cannot be stated altogether in dollars and cents, for its indirect value may far outstrip its direct revenue-producing value. As the properly placed wood-lot may protect the crops from injurious winds, give shelter to cattle, and keep the soil from erosion, and the water-flow of springs and brooks even, so the Adirondack forests, kept in proper condition, have an influence upon climate and water-flow for the whole state, and with it, upon its commercial condition and prosperity, which far outweighs the profits that may be derived from their timber, and this indirect profit it is that states and communities should have in view.

While, then, forest-culture may not be profitable in individual cases and for private purposes, it is always profitable for the community at large, for it insures favorable conditions in general and continuity of one of the most useful resources.

Correspondence.

The Winter-killing of Conifers.

To the Editor of GARDEN AND FOREST:

Sir,—A note in GARDEN AND FOREST concerning the injuries to Retinosporas and other conifers in the vicinity of New York, leads me to say that, although the winter here has been most severe, none of the conifers on my place have suffered in the least. Perhaps the injury to these trees in other places may be attributed to the drought in August and September of last year, which was very severe in some parts of the country, rather than to the cold winter. Thirty or forty years ago, whenever I lost an evergreen tree, I used to attribute it to the severe cold, and the same view was held by my friend, the late Winthrop Sargent, of Fishkill, with whom in those days I was in constant correspondence on horticultural subjects. But after many years of experience and close observation I have learned to give my trees much better cultivation, and have discovered that serious injury more often results from the

effects of dry weather in summer than it does from severe cold the following winter.

Of course, our winters here in New England are considerably colder than yours in New York, and if it was the cold alone which injured the trees in your vicinity we surely should have suffered more or less here. This is not the case, however. Of the numerous Spruces and Firs which I have been growing for many years there are twenty species at least which have not been injured by the winters for twenty years past. The Retinosporas do not seem to be quite so hardy as the Spruces, especially *R. pisifera* and some of its varieties. I have occasionally lost one of these, and the small branches die. I have plants of *R. squarrosa*, *R. filifera* and *R. obtusa* twenty feet high which have never been at all injured, and the same is true of *Thuopsis dolobrata* and *T. Standishii*, although they are not quite as large.

Wellesley, Mass.

H. H. Hunnewell.

[We attributed the injury to coniferous trees in this vicinity this year to very cold winds in March after a few unusually warm days. The injured trees, however, may have been weakened by the drought of last year. There can be no doubt as to the accuracy of Mr. Hunnewell's observation in regard to the effect of autumn droughts on coniferous trees. If the ground after a dry autumn does not get saturated with late rains before it freezes up for the winter, evergreen trees are certain to suffer more than others, for the leaves continue to transpire moisture to a certain extent all winter, while the water from rains and snows cannot penetrate to the roots through the hard frozen surface. If, therefore, the subsoil is dry—that is, if the roots cannot respond to the demands for moisture made by the leaves—the trees will suffer. We have a note from Mr. William Falconer stating that Mr. Charles A. Dana's collection of conifers at Dosoris, Long Island, suffered to a considerable extent, and the injury there was done in March, at the beginning of which month the evergreens were never in better form. Some of the Retinosporas, like the varieties of *R. pisifera*, especially *filifera*, suffered seriously; others, like *R. squarrosa* and *plumosa*, to a less degree, while the various forms of *R. obtusa* suffered least of all. It is worth noting, too, that at Dosoris, *Azalea amœna* came out unscathed, although it was in the teeth of the wind, and *Osmanthus ilicifolius* was also unharmed, while Broome, which had survived for years, was nearly killed, and Furze suffered still more.—Ed.]

Rose Sports.

To the Editor of GARDEN AND FOREST:

Sir,—An acquaintance of mine has a bush of the Baroness Rothschild Rose which has sported—that is, one of its branches has flowers which resemble the parent plant in form but are nearly pure white in color. Do sports of this kind always remain true when grafted, and will it be worth while to try to perpetuate this one?

Montclair, N. J.

C. R.

[It is always worth while to perpetuate a good Rose if it is any improvement on what we already have. The Baroness Rothschild is one of those varieties which have a tendency to sport, and we already have some good white-flowered plants from it as a parent. Mabel Morrison is one, and so is the *Merveille de Lyon*. There is no certainty, however, that any sport when grafted will remain true. Very often the first flowers from grafts will be identical with those of the original plant. These sports themselves are more liable to sport than other plants, and some of them lack fixity to such a degree that one can never be sure of them, although a portion of the grafts may continue to persist in the new form. Of course, stock and soil may have some influence upon the grafts, but, really, our knowledge of these matters is limited as yet, and we cannot account for many of the vagaries of sports.

We infer that the difference from the sport mentioned by our correspondent and its parent is simply one in the color of the flower. There are many other cases in which there is a distinct change in the habit of the plant as, for example, where some Rose, like *Victor Verdier* or *Niphetos*,

develops so-called climbing varieties. This means that from the original plant there will start some shoot which grows with remarkable vigor. The *Devoniensis*, for example, is not a strong grower, but its climbing varieties sometimes grow twenty feet in a season, although its flowers are true to the original type. Variations of this sort may be traced to some remote ancestor, but, so far as we know, this habit of growth is more liable to be fixed than simply variation of color.—Ed.]

Sweet Alyssum.

To the Editor of GARDEN AND FOREST:

Sir,—In summer-time no family owning the smallest lot of ground need be without a pretty centre-piece for the table if precaution has been taken to sow some seeds of Sweet Alyssum in April or May. This little plant thrives in any soil, and two packets of seeds sown in a bed or as a border will yield a plentiful supply of flowers the entire season through. They should be picked with long stems, and in plentiful quantity. The children of the family will do this work with pleasure, and they may also be taught to arrange the flowers afterward. A silver fern-dish is admirable for this purpose, but any low open bowl will answer, if it be but of glazed earthenware.

A piece of wire netting with meshes about half an inch square, a trifle larger than the top of the bowl, should be placed on the bowl when filled with water. Then set a blossom in each mesh, making sure that the stem reaches well into the water. The netting keeps the flowers in place; they stand more erect, and, in changing the water, it is only necessary to lift the netting, and replace it when the bowl is filled. By changing the water every morning a bowl of flowers will keep quite fresh for three days, as the stems do not crowd upon each other as they do in the old way.

Mignonette mingles well with Sweet Alyssum or Heliotrope or a few sprays of pink or red Geranium; but only flowers of one color should be used at a time, and these sparingly.

Brooklyn, N. Y.

Mary F. Harman.

The Flowers of Euphorbia.

To the Editor of GARDEN AND FOREST:

Sir,—Your correspondent O. O. makes a very natural mistake when he says, on page 224 of your issue for May 11th, that it is the flowers that are ornamental in the case of the *Euphorbia jacquiniæflora*. Referring to Gray's *Field, Forest and Garden Botany*, we read: "*E. fulgens*, or *jacquiniæflora*, . . . what appears like a 5-cleft corolla are the bright red lobes of the involucre."

Milton, Mass.

Nathaniel T. Kidder.

Notes.

The Diet of the Tyrol recently decreed that a heavy fine shall be imposed upon any person offering for sale a sample of Edelweiss that has been pulled up by the roots.

We have received a photograph from Mr. W. B. Hartland, of Cork, Ireland, of a mass of Horsfield Daffodils planted thickly over a bed of about a hundred square feet in extent. Judging from the picture, these plants have wonderful vigor and attain remarkably good form in the "old country."

The white flowers of the Black Haw are beautifying many of the road-side thickets within a few miles of this city, and there is no more attractive small tree or large shrub than this native *Viburnum prunifolium* as it appears in our woods and parks. Besides the beautiful flowers, the bright red bark of the young twigs and the reddish tint of the young leaves add to the beauty of the plant, and the foliage is no less striking in autumn, when it turns from its bright green to rich orange and purple.

The earliest Pæonies to bloom, and they are now at their best, are the varieties of *P. tenuifolia*. These are not new plants by any means, but since they are so easily cultivated, so perfectly hardy and so beautiful, it is remarkable that they are not more common. The single form is especially beautiful with its dark crimson flowers, which are borne on stems some fifteen or eighteen inches high surrounded by finely cut foliage. The double-flowered forms are also very beautiful, and the foliage is rather more delicate.

A preliminary announcement, with schedule of prizes for the Chrysanthemum Show at Madison Square Garden next fall, has been issued. The exhibition will be under the auspices

of the New York Florists' Club, and will be held from November 1st to the 6th inclusive. Six thousand five hundred dollars in premiums are already offered, and it is probable that a supplementary prize-list will be issued later. We are glad to observe that preparations are being made for a spring show next year, and that exhibitions both in the spring and in the autumn may be expected every year hereafter.

Flowering specimens of Bechtel's double-flowered American Crab have been sent to us by E. A. Bechtel's Sons, of the Staunton Nursery, Staunton, Illinois. It is a double-flowered variety of the western form of *Pyrus coronaria*, which botanists have called variety *icensis*, and is said to have originated in the neighborhood of Staunton. The flowers are pink, very double, and, like those of all the native Crabs of eastern America, delightfully fragrant, in this respect being far superior to any of the double-flowered Crab-apples in cultivation. The fact that the flowers are not produced until the leaves are almost fully grown, and much later than those of any other Apple-tree, adds decidedly to the value of this novelty, which, judging by the specimens before us, is one of the most beautiful hardy plants of recent introduction.

A writer in the *Boston Evening Transcript* declares that the plantations made by the Boston and Albany Railway Company around its suburban stations have had a decided influence in improving the horticultural taste of the people living along its lines, and that good plants, like *Forsythia Fortunei* and other hardy shrubs, have been made common and popular in this way. The scheme under which these plantations are made has already been described in these columns. The station-grounds are decorated with trees and the best hardy shrubs, preference being usually given to native species, as being more hardy and generally more satisfactory than exotic plants; no bedding or tender plants whatever are used, the effect being obtained from well-kept lawns, skillfully arranged shrubberies, in which it has been aimed to secure a succession of flowers, handsome fruit and brilliantly colored autumn leaves.

A correspondent of *Gartenflora*, writing from Orizaba, in Mexico, says that one of the most beautiful flowering plants to be seen there is *Datura arborescens*. "It is a native of Peru, but flourishes finely here. Where sufficient room is given, it develops as a broad shrub some fifteen feet in height, and at almost every season of the year is covered with a profusion of large, dazzling white flowers. The burden of these flowers weighs down the branches, but the beauty of the plant is merely increased by this fact. The double sort grows even more luxuriantly. Native Mexicans usually train these plants as standards with a flat, wheel-shaped head, from the under side of which depend the many blossoms. But, to me, their natural manner of growth is even more attractive." This tree-like shrub is sometimes cultivated in our conservatories, but to those who have not seen it there the description we quote will scarcely suggest its intimate relationship to *D. Stramonium*, our common Thorn-apple or "Jimson-weed."

We received last week a large package of cut Orchid-flowers, mainly *Cypripediums*, from the collection of Mr. T. F. MacFadden, of Cincinnati, Ohio. Among them were several spikes of *C. Rothschildianum*, each with four well-expanded flowers, and one splendid form with three flowers of great size and extraordinarily rich coloring. Unlike many other *Cypripediums*, the blossoms of this one remain on the spike until all the buds are opened, which makes it very desirable. There was also a six-flowered spike of *C. leucorrhodum*, with a superb variety of *C. selligerum majus* carrying three flowers. Among other handsome flowers were some of *C. Schroderæ splendens*, fine examples of *C. grande* and *C. alborpurpureum*, several distinct and unusually richly colored flowers of *C. Curtisii*, with good examples of *C. almun*, *C. macropterum*, *C. niveum*, *C. bellatulum* and many others. The flowers, as a class, showed unusually good care and cultivation, and reflected great credit on Mr. John Rose, the gardener, who has this fine collection in charge.

We received last week from E. O. Orpet, South Lancaster, Massachusetts, a collection of *Narcissus*-flowers in some forty varieties, representing the choicest kinds in all sections. The flowers were well grown, and formed beautiful, graceful masses. All the leading kinds were represented, and there were many interesting ones seldom seen and not often found here. In the Ajax section, P. R. Barr was noted as a very bold, full, yellow flower. Of the Discolors, James Walker and Michael Foster were beautiful and distinct. The collection was rich in the *Incomparabilis* section. Some distinct kinds were Barr's *Conspicuus*, *Orphée* and Maurice Vilmorin, all with

deeply stained orange cups. Hume's Giant was an extra distinct flower with broad-spreading cup and a good clear yellow. The forms of Burbridge's hybrids, the connecting link between *N. poeticus* and *N. incomparabilis*, were very charming, and were represented by a selection of the best kinds—Crown Princess, pure white perianth, canary cup, edged scarlet, a rare and distinct kind; Constance Falstaff; John Bain, a charming flower with citron cup and white perianth, and the rare Princess Louise, with widely expanded deep orange-scarlet cup and large white perianth.

Among the many schools for summer study which are promised for the present year will be a course of instruction in horticulture at the Bussey Institute, beginning on July 6th and ending on August 3d. A synopsis of the lectures which are to be delivered by Mr. B. M. Watson, Jr., shows that the instruction will cover a wide range of subjects which will be of scientific and practical value to students of horticulture. These subjects will include soils, propagation of plants by various methods, grafting, construction of glass-houses, insects and fungi, hybridizing, pruning, and others of equal importance. Supplementary lectures will be given from time to time, when the exercises will be held in the open air, and illustrated by visits to the more important classes of plants in ordinary cultivation, such as conifers, flowering shrubs, herbaceous plants, garden-annuals, house-plants, grasses, *Rhododendrons*, *Roses*, *Chrysanthemums* and *Lilies*. In addition to the instruction in the theory and practice of gardening and the field-talks already spoken of, there will be opportunity for practical work in both greenhouse and garden. About eight hours a day will be devoted to work of different kinds, and the course will be open to women as well as men. The collection of trees and shrubs at the Arnold Arboretum will give ample opportunities for illustrating this course, which is one of the new undertakings to which all those interested in horticulture will wish the highest success.

In addressing the Association of American Cemetery Superintendents at Chicago last autumn, Mr. Eurich, of Toledo, Ohio, said, with regard to plants that can be used to cover the ground beneath trees where grass will not grow, that he had experimented successfully with two "sod-forming" plants, *Herniaria glabra* and *Veronica repens*. The first-named, he explained, "is a moss-like, creeping plant which covers the ground in a very short time, and surpasses a grass-sward in beauty. A strip of ground was planted in April with one hundred such plants set apart, and in less than two months the entire surface was covered closely. The plants were thinned out so that we obtained more than twice the original number, and an adjoining new piece was planted with the same result. This procedure was repeated in August, and before winter set in we had a beautiful greensward of *Herniaria* growing. A very cold winter followed, and the plants were tinged slightly brown, but by April were again charmingly green. *H. glabra* will thrive in any soil in the open sun or in the shade." *Veronica repens*, the speaker said, "has somewhat larger leaves of shining green and generally the same characteristics as *Herniaria glabra*. A grave-mound planted with it in August was completely covered by fall, and with a slight protection during the winter was brighter and fresher than the mounds covered with Myrtle (*Vinca*) and Ivy. The special feature of this plant is that in May it is completely covered with very light blue flowers as low as the plant itself."

Edward von Regel, the venerable Director of the Imperial Botanic Garden at St. Petersburg, died on the 27th of April, in his seventy-seventh year, he having been born at Gotha on August 13th, 1815. Regel was first established at Zurich, but many years ago was called to the directorship of the St. Petersburg garden, which he has labored assiduously to bring to its present state of efficiency. He was the author of a large number of botanical works devoted mostly to the description of plants collected by Russian travelers in central Asia. He was the founder and for many years the editor of the *Gartenflora*, and in the Acts of the St. Petersburg garden are many papers upon garden-plants from his pen. To Regel, more than to any one else, is due the success of the International Horticultural Exhibition held at St. Petersburg in 1869; and he has enriched the gardens of America and Europe by his liberal distributions of the seeds and plants gathered by his correspondents in all parts of the vast Muscovite empire. No one has surpassed him in this or in his desire to serve his associates, and to the intelligent zeal and broad-minded liberality of this active and industrious man is due the introduction of many of the best plants which have been brought into gardens during the last twenty-five years.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLES:—Good Taste in Our Cemeteries.....	253
The Florists' Shops in Berlin.....	254
The White Oak at Shandy Hall, Maryland. (With figure.).....	254
Mid-May in West Virginia..... <i>Mrs. Danske Dandridge.</i>	254
A Sequence of Flowering Cherries..... <i>J. G. Jack.</i>	255
NEW OR LITTLE-KNOWN PLANTS:—Asarum Crux-Andræ. (With figure.)..	256
New Orchids..... <i>R. A. Rolfe.</i>	256
PLANT NOTES:—Some Recent Portraits.....	257
FOREIGN CORRESPONDENCE:—London Letter..... <i>W. Watson.</i>	257
CULTURAL DEPARTMENT:—Bulbous Irises..... <i>Professor M. Foster.</i>	258
Rock-garden Notes..... <i>R. Cameron.</i>	260
Roses..... <i>W. H. Taplin.</i>	260
The Cultivation of Blackberries and Raspberries..... <i>E. P. Powell.</i>	260
Insecticides and Fungicides in the Orchard..... <i>T. H. Hoskins, M.D.</i>	261
Some Vegetable Notes..... <i>Professor W. F. Massey.</i>	261
THE FOREST:—Forest Experiment Station at Santa Monica... <i>Frank M. Gallaher.</i>	262
RECENT PUBLICATIONS.....	263
NOTES.....	263
ILLUSTRATIONS:—Asarum Crux-Andræ, Fig. 49.....	257
White Oak (<i>Quercus alba</i>) at Shandy Hall, Maryland, Fig. 50.....	259

Good Taste in Our Cemeteries.

WE spoke last week of the views of certain prominent American cemetery superintendents, as expressed at the last meeting of their association, with regard to the aspect which our rural cemeteries should wear. We quoted their own words to show that their ideal of a cemetery is a simple, peaceful place in which a natural, rather than an artificial, type of beauty has been secured; a place not crowded with costly and showy monuments or rendered garish by gaudy flower-beds; a place neatly kept, although not trimmed and polished into the semblance of a public park or a private garden. And we said that, according to their witness, this ideal would be more often attained were it not for opposition to the plans of superintendents on the part of their employers.

This opposition was not dwelt upon in any carping or militant spirit by any of the speakers; but all the addresses clearly suggested it as a thing which need not be dwelt upon because already so generally recognized as the chief bar to the improvement of the average American cemetery. Here and there we find in the report of the speeches a more definite statement, as, for instance, with regard to the "prevailing anxiety" of lot-owners to "compete with each other" in the erection of conspicuous, ugly monuments; and, again, with regard to the popular demand that flowers be planted "profusely," and the difficulty in meeting specialized desires of this sort—of having any assurance that the flowers will be planted artistically rather than ridiculously.

"When we have said all we can," remarked one superintendent, "there still remains the fact that the public are the patrons of every cemetery association. The public, consisting of many men of many minds, to their wishes and desires we must all, to a great extent, conform. We may denounce pathways, stone-work, flowers, shrubs and borders, and lay down methods of burial and selling of

lots, and advocate perpetual care, but we cannot adopt any hard and fast line of refusal or enforce arbitrary rules; even by-laws have occasionally to be overlooked to satisfy the public." And another speaker drew a picture of the appearance of a cemetery to which he was appointed, which has, we think, a certain typical significance. "Every lot-holder," he said, "had been permitted to plant and decorate as he desired. To add to this, seedling and volunteer growth abounded, and the management was permeated with the sentiment of 'Woodman, spare that tree.' Receptacles for flowers of every imaginable construction—iron, wood, tin, glass, china—the greater number of them unfit for any other purpose, were considered just the thing for decorating the cemetery-lot. No uniformity of grade existed, some lots being high, some low; there were big mounds and little mounds, and many of them transformed, becoming depressions in the ground, and many of them selfishly enclosed with several hundred iron railings in various conditions of neglect. . . . In one day I swept off the lots six great cart-loads of conch-shells and their contents. In the ideal cemetery," continued this speaker, "there are no paths nor space laid out for walks. The boundaries of the lots are out of sight—no posts, no foot-stones, no head-stones, no mounds to designate a grave, but a succession of beautiful lawns broken only by a single monument upon a lot. The irregularly shaped lots allow space for the planting of trees in groups and single specimens and the arranging of flowering shrubs for foliage effects."

The contrast between these two pictures is instructive, and shows pretty fairly what a rural cemetery often is when controlled by the taste of the community and what it may be if really controlled by such superintendents as are now available. To some readers the ideal picture may seem exaggerated. No person of taste will insist that the boundaries of lots should be conspicuously marked, that graves or the borders of lots should be turned into crazy-quilts of flowers, or that monuments should be so numerous and striking that the cemetery will look more like a marble yard than a place of eternal repose. But to limit owners to a single monument in each lot may seem to be an exaggeration of the desire for a "natural" effect. In truth, it is not desirable that the true character of a cemetery should be so carefully concealed that it might be taken for a park or an uncultivated piece of nature. It ought, of course, to look like a burial ground, although like a simple, quiet, peaceful, unostentatious burial ground. And, if monuments are kept of small size and are designed in simple yet artistic ways, there is no reason why lot-owners should each be limited to one. There is, however, a good reason for doing away with those grave-mounds to which traditional sentiment so strongly clings. In the first place, they are constant temptations to the introduction of floral ornamentation of too striking and gaudy and, at the same time, too ephemeral a sort. And, in the second place, if they are covered with turf, it is hard to keep them and their immediate surroundings neat. Labor is so costly in this country that the lawn-mower must be the chief if not the only aid toward neatness in the lawns. And mounds over which the lawn-mower cannot pass are almost sure to be detrimental to the general effect of a cemetery. So it also is, of course, with boundary stones around the lots; even if they are kept so low that they do not unpleasantly affect the eye, it is impossible properly to cut the grass around them.

In general, the ideas of this Association of Superintendents, as expressed by the chief speakers at their last meeting, seem worthy of cordial endorsement; and we feel with them, not only upon their evidence but also upon that of our own observation, that the chief thing now to be accomplished is the education of the public taste in such matters. The taste of many superintendents is evidently far in advance of that of their patrons, and it is probable that even those whose taste is still on a level with this would quickly meet the wishes of their patrons should these take a better direction. No person in charge of a

cemetery, even if his own taste is still crude, is likely to cling, against the desires of his patrons, to traditional crudities, mistakes and abuses which largely increase the difficulties of his task and force him to spend a great deal of money to preserve his domain even in a tolerably neat condition.

There is only one serious fault which we find in any of the addresses from which we have quoted. This is a fault in expression, in terminology, rather than in idea. Nevertheless, so strong is the influence of terms upon thought, that it may give rise to mistaken ideas in other minds. The excellent address of Mr. Scott, of Chicago, in which he pleaded the cause of natural beauty in the cemetery, was unfortunately entitled "Nature versus Art," and was in answer to the question, "Should not Cemeteries present more of Nature and less of Art?" Had "artificiality" been substituted for "art" in these titles the subject would have been more justly presented. What the speaker was really pleading for was not nature, which means beauty that man's hand has played no part in creating, but a kind of art in which the leadings and teachings of nature's types of beauty are discreetly followed. A cemetery planned and maintained as Mr. Scott would have it is a true work of art. One that is badly designed, untidily kept, and overcrowded with inappropriate monuments and flower-beds, is not a work of art. It is an ugly, artificial, inartistic thing. In condemning it and its customary contents, Mr. Scott need not have protested, "Far be it from me to condemn art" in its proper place. For he was really pleading the cause of art while nominally pleading the cause of nature. The fact that practical considerations with regard to ease in labor and cheapness of methods largely entered into his considerations does not invalidate his position as an advocate of true art. There are many artistic enterprises in which practical considerations are very important; and, as in the case of the architect, for example, he is the best artist who can to the best advantage deal with questions of every-day convenience, cost of construction, ease of maintenance and the like while working out with the highest taste and skill the artistic side of his problem.

A WRITER in *Gartensflora* recently complained with bitterness of the aspect of florists' shops in Berlin. Here in America there is sometimes occasion for just complaint that florists fail to secure the highest effect which an artistic arrangement of their stock might produce. But in Berlin it seems that errors of commission are much more distressing than the occasional errors of omission here. For instance, the present fashion, says the writer in *Gartensflora*, is to encircle all blossoming plants which are offered for sale with cones of the most gaudily colored "calico-paper," so that the plants themselves are almost concealed from sight, and, of course, when they are visible, show to the worst advantage. To this custom the writer attributes a great recent decrease in the sale of potted-plants, although he explains it by saying that it springs from the natural desire of purchasers not to soil their hands and clothes by contact with the pots. This explanation we may in turn explain by saying that our practice of having all goods delivered at our homes by the shop-keeper does not largely prevail in Germany, where even the family marketing is usually carried home by the house-wife or her servants. The writer then says that, in another direction, good taste is increasing, for the once beloved "mosaic bouquet" has given place to what he calls the "true German bunch of flowers." To an outsider it may seem that this new taste for naturally cut flowers may have been imported into Germany from Paris or America. But, at all events, the Berliners might learn from Paris to use sheets of pure white paper for enveloping flowering plants. Were the innumerable white cones removed from the plants, which once a week crowd the great steps surrounding the church of the Madeleine, the gayety and beauty of one of the most charming scenes that Paris offers would be grievously impaired.

The White Oak at Shandy Hall, Maryland.

WE have already published several pictures of the White Oak, but in order to give a complete idea of any species it is necessary to study many specimens, both in full foliage and in the winter, when the absence of leaves shows more clearly the texture of the bark and the ramification of the branches. The White Oak, when it has room for full development, is one of the noblest of our deciduous trees, and the specimen which is illustrated on page 259 is one of the comparatively few which have escaped the general destruction of the primeval forests in the earlier-settled portions of the country. It is situated at Shandy Hall, in Maryland, about eight miles below Havre de Grace, on the mainland opposite Spesutia Island. The tract of land which has borne the name of Shandy Hall for several generations was taken up on the first settlement of Harford County, and the original deeds, in the possession of Mrs. Anna E. Barnard, bear the royal seals and are dated 1640. The property has always remained in the possession of the Hall family, which is an unusual thing in our country, where local attachment does not seem to be developed as strongly as it is in the older countries of the world. That this tree is very old is plain not only from its size, but from the fact that in a deed dated 1676 it is called the Big Spreading Oak, and a boundary stone, which is alluded to in the deed as standing under the tree, remains there still. Near the ground the trunk of this tree measures thirty-six feet in circumference, and just below the first limb it is twenty-two feet in circumference. The spread of the branches is unusually large, and covers a circle of 122½ feet in diameter. It is still in good health, and seems sufficiently vigorous to last another century at least.

Mid-May in West Virginia.

THAT enchanting fortnight, when the fruit-trees seem to have foliage of flowers, is over now, and all the loveliness of Apple-bloom is past. Here and there a massive, well-rounded Horse-chestnut shows its great white clusters, and a deep-red variety is very handsome. Horse-chestnuts seldom combine effectively with other trees; they are best in isolated positions or in clumps of three or four. The shade they throw is so dense that grass does not flourish beneath them; it is well to take this fact into consideration when designing the home-grounds, and not plant them too near the dwelling.

The latest of the Amelanchiers is the variety *Floribunda*. This blooms about three weeks after the earlier *Shad-bushes*. The petals of the small-flowered clusters are rounded, not elongated like the other varieties, and the pink-tipped stamens are very pretty; but the plant lacks the fragile elegance of *A. Canadensis*. It has somewhat the appearance of a blossoming Pear, except that the flowers are smaller, and it makes a pretty little tree from ten to twenty feet in height. The bloom of this variety is now fading.

The flowers of the common Snowballs and the Japanese *Viburnum plicatum* are gradually whitening under the warm sunshine. Weigelas are opening their buds, and the day of the flowering Dogwoods is nearly over.

Coronilla Emerus, *Cytisus purpureus* and *Caragana Cham-lagu* now represent the Pulse family in the shrubberies. The *Cytisus* is quite covered with its papilionaceous blossoms of pink and cream, and is an exceedingly pretty, small shrub; useful for planting close to a piazza or on the outer margin of shrubberies. Like *Daphne Cneorum*, one wants it close at hand and apart from free-growing shrubs, which would rob it of light and nourishment. It remains a long time in flower.

Some upright or bush Honeysuckles are now flowering; but perhaps the queen of the shrubbery at present is Paul's beautiful double variety of the Hawthorn, *Crataegus Oxyacantha*. Its flowers look like small double roses, of a rich carmine color, and the tree seems perfectly healthy, free from insects, and a more rapid grower than most Thorns.

Last year, and the year before that, we found the first rose on the third of May; but the cold spring of this year has retarded all vegetable growth, and it was not until May 18th that the first Cinnamon and Scotch Roses ventured to disclose their beauty. A few more days of the warm sunshine we are now having will transform the home-grounds into a Rose-garden; an Eden into which, alas! the enemy will find

entrance in the shape of myriads of bugs and slugs, the inevitable accompaniment of the blooming Rose.

Elaeagnus longipes is now flowering profusely. The tubular, four (sometimes five) parted blossoms closely scattered over the twigs are cream-colored when they first appear, yellowing with age. They have a strong, not altogether delightful, odor, by which the bees find them out and hasten to the revel it proclaims. The Barberries also hold out many seductions to men and bees, and charm more senses than one. Nothing can be finer than a tall, graceful purple Barberry in full bloom, standing in the sun. Its yellow petals have plum-colored markings on the under sides, to match the rich coloring of the leaves and young twigs. These Barberries need bright sunlight to develop their beauty. They are dull of hue when planted in the shade; the outer leaves are always richer in wine shades, the inner foliage usually reverting to green.

Several fine *Spiræas* are now at their best. The long drooping wreaths and garlands of *S. Van Houttei* have a snowy whiteness and grace which makes the shrub conspicuous at a distance, and it rather gains than loses by close inspection.

S. Cantoniensis (known in many nurseries as *S. Reevesiana*) is coming into flower. I learn that it cannot always be trusted to live through New England winters, but in this latitude it is one of the very best spring-flowering shrubs.

Nevuisia Alabamensis is still beautiful with its delicate flowers of white and green. These last a long time, and know how to grow old gracefully; the absence of petals preventing the unsightly appearance many shrubs present in the fading stages.

Japan Maples are in full foliage, and their colors are at their brightest. The hot suns of July and August will dull them, but they brighten again under the skies of autumn.

The fresh green of the new growth on many conifers enlivens the sylvan picture; and all of the deciduous trees, with one exception, are now in leaf. This exception is an *Acacia* or *Albezzia*, of whose proper name I am doubtful; a beautiful, small tree, with foliage resembling a Sensitive Plant, which is described in some nurserymen's catalogues as *Acacia Memu* or Japanese *Acacia*, and is said to have pink flowers. Ours has never bloomed, and is always the very last of our plants to unfold its beautiful leaves.

Honey Locusts, Paulownias and Paper Mulberries are among the latest of trees to leaf, but these are all well under way and have made great progress in the last two days.

The Red-branched Dogwood is no longer worthy of the name, its brilliant coloring having passed away, or being confined to the twigs that bear the flower-clusters. It is at all seasons a handsome shrub.

Rhododendrons are beginning to bloom, and many Azaleas are now in their prime. The hardy Azalea is a plant that requires very skillful management. The colors are so apt to quarrel, and to require separation after the groups are formed. Such dissension in one family is unfortunate. I am inclined to prefer the wild Azaleas to any of the imported varieties; the colors are not so glaring. Of course, the bright magenta and the flame-colored types should never be planted in juxtaposition, yet how often this is done. If perfect accord is wanted in the garden, they should not be in hailing distance of each other. Groups of Azaleas of harmonizing hues are much more effective than single specimens, and it is well to plant them where they will have some dark evergreens for a background.

Rose Brake, West Va.

Danske Dandridge.

A Sequence of Flowering Cherries.

WRITERS on Japan constantly tell of the love the Japanese have for flowers, of the various favorite varieties, and of the national fêtes in honor of them. We are told that one of the plants so highly honored is the Cherry, and that every spring-time there are Cherry-blossom festivals which have something of a national character. It frequently happens that the illustrations of Japanese subjects furnished by artists, in which Cherry-blossoms are supposed to be represented, give us what appear to be Peach or Apricot flowers, and it is quite likely that they should have been called so, from a correct and botanical point of view.

That there are most beautiful species or varieties of flowering Cherries in Japanese gardens we know by a number of plants which have been introduced into cultivation in Europe and America. One of the earliest-flowering of these, as it is of all the species with which we are acquainted, is what is considered to be *Prunus pendula*, or a form of it, which has been derived from nurseries under the name of *P. (or Cerasus) Sieboldii pendula flore rosea* and *Cerasus Japonica rosea pendula*. This season the first blossoms of a particular plant

opened about April 25th. It was in full bloom about May 2d, and continued to be a conspicuous and very beautiful object for fully ten days longer.

The flowers, which are produced in fascicles of three or four from a bud, and on long slender stalks, are pale rose-colored, and appear before there is any indication of leaves. The calyx and calyx-lobes and portions of the flower-stalks are of a dark red color. The flowers are produced in great profusion, and apparently there is no appreciable variation in their abundance every year, which adds much to the value of the plant for ornamental purposes. The fruit is very small, being hardly larger than a pea, of a dark red color, sour and with little pulp. It has not been produced in sufficient abundance here to be ornamental on the plant in the fruiting season, so that, except for the blossoms and its pendulous habit, it has no other special claim for ornament or utility. Its specific name of *pendula* is well applied, for, although the main branches are horizontal or diverge from the trunk at an upward angle, they ultimately assume a widely arching form, the extremities and all the lateral branches being pendent or pendulous. The largest specimens here are now from fifteen to eighteen feet high, and the indications are that they will not grow much higher.

A plant of similar habit, but with variations in the leaves and color of the flowers and some minor details, is sold from the nurseries under the long name of *P. (or Cerasus) Sieboldii pendula flore carneo*, although the *pendula* is sometimes left out. It is also distributed as *Cerasus Japonica pendula rosea*, and under other names. From a horticultural standpoint its peculiarity and value consist in its flowers being of a deeper red color than those of *P. pendula*. As noticed here it blossoms a day or two later, and its branches have a more angular and less graceful habit. Its fruit is similar to *P. pendula*. Whether they are distinct varieties, from a botanical standpoint, should be proved by raising each from seed. The darker-flowered form is generally considered not as beautiful as the other variety, whose blossoms are so peculiarly and delicately colored as at once to suggest something Japanese, and which is not surpassed in beauty by any other tree of its class of which we know.

Both of these grow exceedingly well when grafted on the common Cherry. They should be grafted so that the point of insertion is at or below the surface of the ground, because the Cherry-stock apparently grows much faster than the cion, and unnatural disproportions in the trunk are always a serious disfigurement, and to be avoided. In specimens in the Arboretum, grafted at the ground on common Cherry, the stock has developed into a large woody mass or base, upon which the trees seem to rest.

There are flowering Cherries from Japan and China which belong to a different type, and which are passing under a variety of names. These are small trees, with closer affinities with, and aspect more like, the common Cherries of our gardens, but differing from them in having conspicuously branched or forked flower-stalks, several flowers being attached by their pedicels to a single stalk common to them all, instead of every flower appearing to have a separate stalk from near the base or bud. There are two distinct forms, and although both have sometimes been placed under the Asiatic species known as *Pseudo-Cerasus*, they are probably representatives of very distinct species. Both of the kinds most common in cultivation have double or semi-double flowers. The earliest to blossom, the first flowers appearing about the first week of May here, blooms before the leaves have fairly expanded, and has petals of a rosy white or bright rose-color. Its leaves are of a dark green color, and are quite pubescent beneath. The flowers persist for two weeks or more in good showy condition. Among other names this plant is to be had from nurseries as *P. (or Cerasus) Pseudo-Cerasus rosea plena* and as *Cerasus Watereri*.

The other type comes into bloom a full week later. Its blossoms appear with the foliage, and are of a clear china white, the outer petals sometimes flushed with a rosy color, the whole flower when old often having a roseate tinge. It is characterized by lighter green leaves, with smooth leaf-stalks, smooth and shiny on the upper surfaces and glabrous and pale beneath. The calyx is only five-parted, while in the pubescent and dark flowered form there are usually seven or eight divisions. There are numerous other points of difference, and when the plants are seen growing side by side there appears good reason to keep them botanically distinct. The white-flowered form is known by nurserymen as the Double Chinese Cherry, *P. (or Cerasus) serrulata* and *P. Sieboldii alba plena*. It is apparently not so floriferous as the other. Neither of these Cherry-trees, as we have them, assumes a regular form

but are inclined to be rather one-sided in habit, and from data at hand can hardly be expected to attain a greater height than from ten to fifteen feet. They can be more readily grown from cuttings than many others of the same family, but such plants are found to grow so slowly that it is better to propagate by grafting in the usual way.

While none of the species already mentioned attain large size, the double-flowered form of the European Bird Cherry (*P. Avium*) becomes a stately tree, and some old specimens in this vicinity, now thirty or forty feet in height, have been most beautiful objects with their heavy loads of snowy white double flowers on long stalks in clusters of several from a bud. The period of best bloom is usually about the middle of May here, the flowers being simultaneous with those of the white-flowering Japanese Cherry just mentioned. No double-flowering Cherry surpasses it in effective beauty of its bloom, and since it becomes a large tree it requires room for growth and full development. This tree is to be obtained as *P.* (or *Cerasus*) *Avium alba plena* or *P. Avium multiplex*. Instead of *P. Avium* we occasionally find it classed as *P. Cerasus*, which is a separate and distinct species, and from which a double form has also been derived. This is sold by nurserymen as *P. Cerasus ranunculiflora*, or *flore pleno*, or *Cerasus Caproniana ranunculiflora* or *multiplex*. In the confusion of names it is also occasionally found under *P. Avium*, from which it may be distinguished by its perfectly glabrous, shining, almost sticky leaves, which appear much later than in the other variety. Its blossoms, also, do not begin to develop until about two weeks after the first flowers of the double-flowering *P. Avium* are seen, and it is the latest of the strikingly ornamental Cherries to blossom. The flowers are quite as double as those of the other species, but are less graceful and have a greenish centre, and the tree does not attain anything like such a large size.

Arnold Arboretum.

J. G. Jack.

New or Little-known Plants.

Asarum Crux-Andræ.

ASARUM is a small east temperate North American and Antillean genus of a few subfruticose plants with black dotted leaves and solitary yellow flowers, of the Hypericums family, principally distinguished from the true Hypericums by their four, instead of five, unequal sepals, their numerous distinct, not clustered, stamens, and ovoid capsules. The species are little known in gardens, although *Asarum Crux-Andræ*, of which a figure appears on page 257 of this issue, in spite of the fact that it is rather delicate in cultivation, is a good subject for the rock-garden or the margins of small shrubberies, as the habit of this little plant, which, under favorable conditions, spreads into broad mats of bright foliage studded during several weeks in summer with clear yellow flowers, is well suited for such purposes. The much-branched stems rarely rise more than four or five inches above the ground, and are thickly clothed with small narrow obovate-oblong leaves, furnished with two glands at their bases. The shape of the flowers is interesting, and to their peculiar form is due the name by which this plant is known, St. Andrew's Cross. Of the four sepals the two outer are broad, flat and ovate, and the two inner are minute and almost hidden by the petals, which are linear-oblong, acute, arranged in the form of an X, or St. Andrew's Cross.

Asarum Crux-Andræ is not rare on the island of Nantucket; it is rather a common plant in the New Jersey Pine-barrens, and ranges to Virginia, southern Illinois, eastern Nebraska and eastern Texas. It has been an inhabitant of the Arnold Arboretum for several years, but it is not very hardy here, and demands dry, rather sandy, well-drained soil and careful protection in winter.

Of the other species of the genus, none of which appear to have been introduced into gardens, *A. pumilum* inhabits the sandy Pine-barrens of Georgia and Florida; *A. hypericoides*, a taller plant with erect stems sometimes two feet in height, ranges from our south Atlantic and Gulf states to the West Indies; *A. stans*, with large broad petals and showy flowers, is distributed from New Jersey along the coast of Texas, and is a handsome plant, which may be expected to make a useful addition to the

list of small garden-shrubs; and *A. amplexicaule*, an erect-stemmed plant with large clasping leaves and bright yellow flowers an inch in diameter, is a native of the south Atlantic states and of Cuba.

C. S. S.

New Orchids.

DENDROBIUM × **ROLFEÆ**, Sander. — A charming hybrid, raised in the establishment of Messrs. F. Sander & Co., of St. Albans, from *D. primulinum* crossed with the pollen of *D. nobile*. It has large delicate-colored flowers, in which the influence of the pollen parent decidedly preponderates. — *Gardeners' Chronicle*, April 23d, p. 522.

VANDA ARBUTHNOTIANA, Kränzlin. — A species allied to *V. Roxburghii*, with golden-yellow flowers transversely striped with purple. It is a native of the Malabar coast, and was introduced by Messrs. F. Sander & Co., of St. Albans. — *Gardeners' Chronicle*, April 23d, p. 522.

CATTLEYA ALEXANDRÆ, L. Lind. & Rolfe. — A very remarkable species, with long peduncles fifteen to eighteen inches long, and bearing six to ten flowers at the apex. These have the general shape of those of *C. Leopoldii*, the sepals and petals being of a coppery brown tint, shaded with violet on the undulate margins, and the lip violet-rose. — *Gardeners' Chronicle*, April 23d, p. 522.

CYPRIPEDIUM EXUL, O'Brien. — A Siamese species, introduced in 1891 by two or three different firms, which has recently flowered for the first time in Europe. It is the *C. insigne*, var. *exul*, of Ridley, but is specifically distinct, and in several respects is more nearly allied to *C. Druryi*. It received an award of merit from the Royal Horticultural Society on April 19th last, when exhibited by R. I. Measures, Esq., of Camberwell. — *Gardeners' Chronicle*, April 23d, pp. 522, 523, fig. 77; also p. 535.

CATTLEYA × **BURBERRYANA**, Sander. — A new hybrid raised in the establishment of Messrs. F. Sander & Co., of St. Albans, who received a first-class certificate for it from the Royal Horticultural Society on April 19th last. Its parentage is stated to be "*C. imbricata* × ♀ [*?* × *intricata*] *superba* ♂." The flowers are said to resemble the latter in shape, the sepals and petals white tinged with pink, and the front lobe of the lip rich crimson. — *Gardeners' Chronicle*, April 23d, p. 535.

CATTLEYA × **PHILO**, Veitch. — A hybrid raised in the establishment of Messrs. James Veitch & Sons, of Chelsea, from *C. mossiæ* crossed with the pollen of the rare *C. iricolor*. The sepals and petals are blush-white, with a faint yellow tinge, the front of the lip crimson with a blush-white margin, the middle of the lip yellow, and the base crimson with whitish veining. It received an award of merit from the Royal Horticultural Society on April 19th last. — *Gardeners' Chronicle*, April 23d, p. 535.

CYPRIPEDIUM × **HUYBRECHTSIANUM**, Vervaet. — A name applied to a hybrid raised between *C. hirsutissimum* and *C. Spicerianum*, which particular cross has already received no less than three distinctive names. Chronologically arranged these are *C. × Medeia*, *C. × Ceres* and *C. × Vanmolianum*. — *Gardeners' Chronicle*, April 30th, p. 554.

Kew.

R. A. Rolfe.

Plant Notes.

Some Recent Portraits.

IN the May issue of *The Botanical Magazine* are figured *Lilium Lowii* (t. 7232), another of the fine Lilies which recent explorations of Upper Burmah have brought to light. Its nearest allies are *Lilium Nepalense*, recently figured in the *Magazine*, and *Lilium Bakerianum*. The plant is described as producing a glabrous stiffly erect stem four feet long from a globose bulb two inches in diameter with small lanceolate scales. The leaves are numerous, scattered, sessile, linear, spreading, and two or three inches long. The flowers, which are borne on long peduncles

furnished with a linear leaf at the middle, are produced in about three-flowered corymbose umbels; they are funnel-shaped, three or four inches long, the expanded limb three inches across, with oblong-lanceolate segments, those of the inner and outer rows nearly uniform, an inch broad in the middle, white, tinged with green on the outside, on the inside, white above, white, tinged with yellow-green, below, and covered, except in the centre, with minute claret-brown spots. This fine plant is named in honor of its introducers, Messrs. Hugh Low & Co., the well-known nurserymen, with whom it flowered in July of last year.

Restrepia striata (t. 7233), a curious Orchid from New Granada, interesting to botanists from its peculiar structure, but of little value from a horticultural point of view.

Lilium Grayii (t. 7234), a well-known plant, first gathered by Dr. Asa Gray in 1840 on Roan Mountain, in North Carolina, and first figured in one of the early numbers of this journal (i., 19, f. 4). The portrait in *The Botanical Magazine* represents dark red flowers, and was made from a plant which flowered at Kew during the summer of 1891,



Fig. 49.—*Asarum Crux-Andræ*.—See page 256.

although the flowers are usually bright yellow, like those of the ordinary form of the closely allied *Lilium Canadense*.

Pilocarpus pennatifolius (t. 7235), a small shrub of the Rue family, and a native of Brazil, with large unequally pinnate leaves and slender racemes, a foot in length, of small red-brown flowers. This handsome shrub was introduced into European gardens forty years ago by Libon as an ornamental plant. Much later it has been learned that it is one of the principal sources of the drug Jaborandi, used in Brazil as a sialogogue and diaphoretic. The parts used are the dried leaves, which leave in the mouth an aromatic, slightly bitter, warm taste, and contain a volatile oil and an alkaloid, also volatile, to which the name *pilocarpine* has been applied.

Didymocarpus lacunosa (t. 7236), a lovely little plant of the Gesneræa family, and a native of Penang, with intensely violet-blue nodding flowers, and a recent introduction of the Messrs. Veitch.

The Garden, in its issue of May 7th, contains colored plates of *Erica hyemalis*, figured for the first time in this journal a few weeks ago, and of its white variety.

Foreign Correspondence.

London Letter.

NORTH AMERICAN CYPRIPEDIUMS.—We have a beautiful display of these plants in the cool Orchid-house at Kew, for which we are indebted to the curator of the Harvard Botanic Gardens and to Mr. Allen. The roots, which were received last autumn, were planted in pans in peat soil, and placed in a cold frame for the winter, where they were kept well watered. As soon as the flower-buds pushed up, the plants were removed into a cool greenhouse, where they developed beautiful leaves and perfect, richly colored flowers. No plants have been more admired this spring than these pans of *C. spectabile*, *C. pubescens* and *C. acaule*, some of which bear seven flowers, while they have all lasted well. This method of treatment has been found perfectly satisfactory. In the open ground we have only moderate success with these beautiful plants. Some of our friends declare that these northern species of *Cypripedium* are prettier in flower than the highly-prized tropical species.

DISAS.—This genus is gradually growing in importance among popular garden Orchids. A few years ago we possessed only *D. grandiflora*, the Pride of Table Mountain; but we now have two other pretty-flowered and easily managed species in *D. racemosa* and *D. tripetaloides*, besides a hybrid named *D. Veitchii*, which was raised from *D. grandiflora* and *D. racemosa*, and which promises to be a first-rate garden plant. A fourth species of promise has lately been introduced from Madagascar, and flowered in England, *D. incarnata*, of Lindley, described by him in his *Genera and Species of Orchidaceous Plants* in 1838, but not introduced alive till now. It has fleshy, strap-shaped leaves nine inches to a foot long, and erect spikes of bright orange-red flowers, with yellow dorsal sepals. The plant thrives in a cool house, and the flowers last a long time. It may cross with the Cape species and yield something good in color.

ODONTOGLOSSUM PLATYCHEILUM is a new species, which recently flowered in the rich collection of Mr. R. J. Measures, Camber-

well, who purchased it among an odd lot of Orchids, from Mr. Lee, of Leatherhead, some years ago. Its habitat, therefore, is at present unknown. Mr. John Weathers, Assistant Secretary to the Royal Horticultural Society, has prepared a sketch of the plant with a description for the *Gardeners' Chronicle*, from which I quote the following: "Pseudo-bulbs ovoid, slightly compressed, ancipitous, monophyllous; leaves oblong lanceolate, 8 inches long, one inch broad; scape short, erect, two (or more?) flowered; pedicels one to two inches long; flowers one and a half to two inches in diameter; sepals oblong lanceolate, white, with blotches of chestnut-brown at the base, keeled; petals similar, but not keeled; lip clawed, with a broadly cordate reniform blade, undulated, pale rose, with scattered blotches of crimson-purple; crest bilobed; column creamy white, clavate. The flowers suggest *Brassia* rather than *Odontoglossum*."

CATTELYA VICTORIA REGINA.—Messrs. F. Sander & Co., the discoverers and introducers of this new *Cattleya*, exhibited a plant of it in flower at the last meeting of the Royal Horticultural Society, where it was awarded a first-class

certificate. As I have already pointed out, it resembles *C. amethystoglossa* in pseudo-bulb and foliage. The flowers are borne on erect spikes, strong pseudo-bulbs producing as many as twenty flowers on a spike; they are six inches in diameter, the sepals oblong lanceolate, the petals slightly broader and undulated, and the lips three-lobed, the central one spreading as in *C. Leopoldii*, the lateral ones folding over the column. The color is soft rosy crimson, with a bronzy metallic shade, especially on the young flowers, the front lobe of the lip being rich crimson. The flowers may be likened to those of *Lælia elegans*. A quantity of plants of this *Cattleya* were sold by auction in London to-day; they were in good condition, and realized from one to five guineas each for plants likely to grow.

LÆLIO-CATTELEYA PHÆBE.—This is a hybrid between *Cattleya Mossiæ* (female) and *Lælia cinnabarina*, which has been raised and flowered by Mr. N. C. Cookson, who exhibited it last week at the meeting of the Royal Horticultural Society, and obtained for it a first-class certificate. It is intermediate in character between the two parents, the color of the flowers being yellow, with a crimson labellum. Messrs. Veitch's *L. Hippolyta* was raised by them from the same species, but they made *L. cinnabarina* the seed-bearing parent.

LÆLIA LATONA was exhibited at the same meeting by Messrs. J. Veitch & Sons, and also was awarded a certificate. It is a hybrid between *L. cinnabarina* (female) and *L. purpurata*, and resembles the latter in habit and foliage, but is smaller, as also are the flowers, their color being deep yellow with a dark crimson labellum.

VEITCHS' MANUAL OF ORCHIDACEOUS PLANTS.—Part viii. of this most valuable contribution to Orchidology has recently been published. It contains synopses of the following genera: *Oncidium*, *Miltonia*, *Ada*, *Brassia*, *Gomezia*, *Ionopsis* and *Ornithocephalus*. As in the previous numbers, the authors have limited themselves to species known to be in cultivation and possessed of some claims to the notice of horticulturists. Maps showing the geographical distribution of the species are given, and, in addition to careful descriptions of the species and interesting historical information, there are also numerous illustrations representing the flowers of some of the most attractive kinds. In dealing with the genus *Oncidium* the authors had a task of some difficulty. There are upward of three hundred described species, a large proportion of which have been in cultivation, but owing to the "miffiness" of many species they have never become established in gardens. The number of species of *Oncidium* described by Messrs. Veitch is 114, and of these, as they point out, a great many cannot be kept in health in English gardens more than two or three years. The genus is rich in beautiful-flowered species, but many of them have this great drawback of bad behavior under artificial treatment. Of course, there are some kinds, such, for instance, as *O. flexuosum*, *O. Batemannianum*, *O. bracteatum*, *O. leucochilum* and *O. sphacelatum*, which are as happy in our plant-houses as is *Odontoglossum crispum*. The *Miltonias* are treated upon exhaustively, as they deserve to be, and *Brassia* also obtains a fair share of notice. The other genera are dealt with in the same careful, discriminative manner which characterizes the whole of the work published up to the present. I am informed that the book will be completed in about two more parts.

BULBOUS IRISES.—A lecture by Professor M. Foster on these plants was one of the chief attractions at the last meeting of the Royal Horticultural Society. The professor finds time to devote to the cultivation of a rich collection of Irises of all kinds in his garden at Cambridge, and he is now the acknowledged first authority on garden Irises in England. But he admits that he has only lately come to understand the bulbous section of the genus represented by *I. reticulata*, *I. xiphioides*, *I. alata*, *I. Sindjarensis*, etc., which are generally notoriously bad to keep in the garden if not properly managed. He recommended growers to

keep this section in a part of the garden by themselves, and to lift the bulbs in summer so as to get them thoroughly ripened by drought, planting them again in late autumn in rich soil. The plants, in fact, should be treated as the Dutch treat their Tulips, Hyacinths, etc., and then there is little difficulty in keeping them and getting them to flower freely. I have before stated that we have proved at Kew that this treatment is suitable for *I. Susiana* and its allies.

THE DANDELION AS A GARDEN-PLANT.—In a piece of semi-wild ground attached to Kew there are now some thousands of plants of the common Dandelion in full bloom. They are broad tufts of rich green leaves with from a dozen to twenty flower-heads springing from each tuft, each head two inches across and colored a rich golden-orange. I know nothing that flowers so early in the year that will compare with these Dandelions for richness of color, floriferousness and elegance. I therefore venture to recommend the common ubiquitous Dandelion as a first-rate plant for spring effect in the garden. I can imagine a few beds of well-cultivated plants nicely placed on the lawn, and glistening in the May sunshine like burnished gold, surpassing any yellow flowers possible out-of-doors in May. The Dandelion is capable of being turned to excellent account in the flower-garden. We have beds of Tulips, Hyacinths, Daffodils, etc., in April and May, but nothing like to, nor even so good as, these big-flowered golden-yellow Dandelions. The French know the value of this plant as a vegetable, and have grown it largely for the last twenty years. According to Monsieur Vilmorin, it was formerly gathered from the fields and meadows where it grows wild, but as it became an important article of commerce in Paris its systematic cultivation and improvement naturally followed, with the result that improved varieties have been raised and their cultivation is now largely practiced. The whole of the plant is used for salad, the leaves being, as a rule, blanched by covering them with pots, as in the treatment of Sea-kale. We do not know the Dandelion as a garden-vegetable in England, but it deserves a place as a "bedding" plant, on account of its beautiful flowers. If, instead of being common with us, it had been obtained from Japan or China or New Zealand, we should have recognized its beauty and fitness for the garden by using it extensively for spring effect. No doubt, it might be improved, or, at any rate, variety of form, size and shade of the flowers could be obtained by cultivation and selection, just as the French have obtained considerable variety in the leaves.

London.

W. Watson.

Cultural Department.

Bulbous Irises.

PROFESSOR MICHAEL FOSTER, of Cambridge University, England, the highest authority on Irises, recently delivered a lecture on the bulbous section of the Genus, which will be published in full in the Proceedings of the Royal Horticultural Society. The lecture, from which we take the extracts which follow, was illustrated by living specimens of many of the species, and also by drawings borrowed from the Royal Gardens at Kew.

Iris Sisyrinchium is one of the most widespread, and is related to the bulbous Irises of South Africa. It is characterized by the bulb being wrapped in a kind of network; it has two narrow leaves, from between which the flower-spike ascends. The flowers open about midday, and close about four o'clock, three or four slightly fragrant flowers being borne upon each spike. It is not a great acquisition to the gardener, and is rather difficult to grow in England. It requires a very hot summer and severe baking, and the bulbs should be taken up and well dried each season.

I. reticulata has a bulb very similar to the foregoing, but the leaves are linear and have four sides. The one generally regarded as the type has violet flowers, but this form is very rare, and is never found among imported bulbs of this species. *I. reticulata Krelagei* is a purple variety. The segments are

smaller and broader, and it has not the odor possessed by the other. As this is very much more common, it might be regarded as the typical form, more especially because, if crosses are obtained between the generally accepted type and *Krelagei*, the seedlings will chiefly follow the characteristics of the latter. *I. reticulata purpurea* is more handsome than the variety *Krelagei*, and there is another small variety of this group called *Cyanea*. *I. Sophroniensis*, an early flowering species, *I. Danfordiæ*, with which *I. Bornmülleri* is synonymous, are also allied to *I. reticulata*, as is *I. Vartani*, an Iris growing in the neighborhood of Nazareth, and flowering in October and November. *I. Histrio*, generally accepted as a different species, is regarded as merely a variety of *I. reticulata*. The flowers are not of a uniform color, but are blotched with lilac on a paler ground. A variety called *Histrioides*, although differing in several respects from *I. Histrio*, is certainly of the same species as that variety, while there can be no doubt about its being a member of the *reticulata* group. An Iris very like *I. reticulata*, with similar bulb and the leaves somewhat the same, is *I. Bakeriana*. The flowers of all these are very beautiful. The plants require plenty of sun and a good loamy soil, which should be rather stiff. They are liable to the attacks of a fungus,

tana is a large one, and grows in the neighborhood of Tangiers. It has a resemblance to the English Iris, but is exceedingly difficult to grow. It blooms early, but it requires a very warm spring and must be dried up in summer.

The Juno group differs from the rest in that the ripe bulbs possess a number of fleshy roots and broad leaves. These roots disappear annually, but if the bulb does not produce a flower, they sometimes remain, because the nutriment contained therein is not drawn upon. *I. alata*, or *I. scorpioides*, is a form of this group having broad leaves. The outer segments of the flower have an ear-like projection in each side, and it has a well-formed crest. The bulb is covered with several coats. It may be grown in the open, south of London, perhaps, but it requires the shelter of a greenhouse in the Midland counties. It has large flowers with various markings, exceedingly fine and fragrant. *I. Persica* is a very beautiful little plant, with flowers possessing very characteristic markings. There are many varieties of this lately introduced. They will stand frost, but require roasting in summer. They should be lifted each year, and thoroughly dried.

I. Caucasia, with its greenish yellow flowers, is not a great acquisition in the garden, but there are several varieties that



Fig. 50.—White Oak (*Quercus alba*) at Shandy Hall, Maryland.—See page 254.

that will cause the bulbs gradually to decay if they are left in the ground. If lifted each year, the fungus is greatly checked.

I. Kolpakowskyana is closely allied to *I. reticulata*, has bulbs with netted coats, but the leaves are not similar; it has a very beautiful flower, and is difficult to cultivate. *I. Winkleri*, with blue flowers, is very similar to the above; the leaves are more or less linear, and the bulb is covered with membranes. It has a somewhat limited distribution in Europe.

I. xiphioides has blue, purple and white flowers in different varieties, but in none of them can any yellow be seen. It is sometimes called the Pyrenean Iris. *I. xiphioides* (the English Iris) requires a more damp situation than the Spanish form. Both are thoroughly hardy, and can be left to themselves to a great extent. The name (English Iris) originated through its being first brought to Bristol and afterward distributed to the different parts of Europe from the west of England. *I. filifolia* is an exceptionally handsome flower—a rich strong purple limb and orange signal. It is slightly allied to the Spanish Iris. It requires a thorough baking, and would be benefited by a little pinching in summer through want of rich soil. *I. Tingi-*

excel the type. One of these deserves the specific name of *Orchioides*, a variety that differs in many respects from the type. *I. Rosenbachiana*, also belonging to the Juno group, is characterized by the fall of the outer segments, its beautiful rich markings at the bottom of the fall, and possessing an exquisite signal. It blooms in February or March, before sending forth any leaves, and sometimes among the snow. It looks like a summer flower, its surroundings not being suitable to its rich color and refinement. In the different plants the color is exceedingly variable, but the form is fairly constant. Another, belonging to the same group, is *I. Fosteriana*, with foliage not so broad, and having less fleshy roots. It comes from Afghanistan. A handsome contrast is presented between the golden-yellow upright part of the flower and the purple fall; it does not take kindly to the English climate. *I. Sindjarensis* is fairly hardy, and grows as well in our gardens as any of this group; a very beautiful and fragrant species.

Some of the bulbous Irises are not strong in their struggles for life, and ought to be grown by themselves and treated with great care, for if left to fight their way among other plants, the result will be disastrous to them.

Rock-garden Notes.

ONE of the chief features of the rock-garden at this time is the Iceland Poppy (*Papaver nudicaule*). The plants of last year have stood the winter extremely well, and are covered with their beautiful yellow flowers. An abundant supply of young plants are coming up from self-sown seed. These will bloom during the summer when the old plants have exhausted themselves, and there will thus be flowers throughout the entire season. *P. nudicaule album* is a beautiful free-flowering variety with satiny white flowers. *P. nudicaule minimum* is distinct, the flowers being intense orange-scarlet. The flowers of these Poppies are about two and a half inches across, and are produced on peduncles from twelve to fifteen inches high. They are fugacious, which renders them worthless for cutting purposes, except those of *P. nudicaule*, which last for several days after they are cut.

From a botanical point of view, *P. nudicaule* and *P. alpinum* are one species. They are, however, distinct enough for gardening purposes to retain their specific names, and can easily be distinguished from one another. *P. nudicaule* has a larger and more robust growth, and the foliage is less divided. The Iceland Poppy should be planted in a fully exposed position in the rock-garden in well-drained, moderately rich and light soil. Seeds are freely produced, and young plants are easily obtained from seed. The plant is a native of the boreal regions of the Old World, and was introduced into cultivation in 1759.

Orobis vernus is one of the hardiest and certainly one of the most charming spring-flowering, herbaceous perennials. It blooms annually with great profusion, even when flowers of this class are scarce. It is a native of Switzerland and Germany, and was introduced into cultivation two hundred and fifty years ago. It rarely ever grows higher than a foot. The flowers are produced on nodding, axillary peduncles. At first they are purple and blue, with red veins, and the keel is tinted with green. As they become older, they merge into blue, so that a plant shows flowers in many different shades. The leaves are composed of two or three ovate-lanceolate, acuminate, shining leaflets. The stem is simple and flexuose. This plant does best in deep, rich, moist soil, and thrives in a shady or an exposed position. It seeds freely and may be propagated from seed or by the division of strong roots.

Omphalodes verna, or, as it is sometimes called, the Creeping Forget-me-not, is an old favorite in gardens, and was introduced from the south of Europe. It is one of the plants to be relied upon for planting in shady positions, and when established it soon spreads. A large clump is growing luxuriously under Pine-trees here, and it produces an abundance of beautiful blue flowers for several weeks. It belongs to the Borage family, and grows from six or eight inches high. The single flower is about half an inch across, and is borne on a few-flowered raceme, on erect stems, which emit stolons at their base. The radical leaves are ovate-cordate and the stem leaves are ovate-lanceolate. *O. verna* is increased by rooted runners in the spring, planted in a shady place, in good, sandy soil.

For the last week *Corydalis nobilis* has been very attractive in the rock-garden, and if the weather is favorable the flowers will last two weeks longer. It is a Siberian plant, and was brought into cultivation in the year 1783. Its habit and form are good, and it grows about one foot high. The flowers are pale yellow, tipped with green, and the spur is long and incurved at the point. The leaves are bipinnate, the segments wedge-shaped and cut at the top. The foliage is handsome, and is further beautified by the graceful habit of the whole compound leaf. It is well suited for the rock-garden, and should be planted in a rather sunny position in deep, light rich soil. It is propagated by division of the roots.

Anemone sylvestris, sometimes called the Snowdrop Anemone, is flowering profusely on a large mound in a rather shady position. This plant grows about one foot high, and well-grown specimens are very attractive. Although this plant is a very old inhabitant of English gardens, it is seldom seen in good condition in America. The flowers are solitary, pure white, about one inch and a half across when fully open, and their drooping habit adds much to their beauty. The leaves are three parted; the lower lobes are deeply divided and are pubescent beneath. It is a native of central Europe, and is perfectly hardy in this locality. It flowers better here on an elevated position in the rock-garden than it does in our borders. It is easily propagated from runners, which grow up around the old plants, or from seed.

Dicentra spectabilis is one of the best herbaceous perennials in cultivation. It was brought to England from China in 1846,

and was known then as *Dielytra spectabilis*. It thrives well either in the rock-garden or in the herbaceous border, but delights in a deep sandy soil. It is largely used for forcing in the spring, and for this purpose a large number of the plants are grown in Holland and Germany, and sent to this country in the fall. It is propagated by division of the roots in the fall.

Cambridge, Mass.

R. Cameron.

Roses.

IN order to secure a regular supply of Roses for cutting during summer and fall, preparation is necessary early in the season. For summer flowers, out-of-doors, Marie Van Houtte and Papa Gontier are excellent sorts, and produce a succession of handsome buds throughout the season. The miniature flowers of some of the Polyanthas also are useful, and those of Clothilde Soupert are notably so, this charming variety being, doubtless, one of the best of its class.

Where one has facilities for indoor planting, summer showers can do no damage, although it must be admitted that Roses under glass will require much more attention than others. For greenhouse-planting Marie Guillot is the best white, La France a satisfactory pink, and Pierre Guillot a good red, while Duchesse de Brabant and Souvenir d'un Ami will furnish a good supply of light pink flowers, though of somewhat inferior quality to those first mentioned.

The planting of the stock should not be delayed now, and as they will only require a depth of about three inches of soil on the bench it is not a laborious operation to prepare for. A thin shade on the glass will be of benefit to the young Roses and will prevent them from drying out too rapidly during the hot weather. A thin mulching of good manure will be beneficial as soon as the plants begin to grow, and abundant ventilation will be needed.

The month of June is the time to note the most satisfactory varieties for permanent planting outdoors and to prepare for increasing the collection for the following season. Dealers' lists are not always reliable in descriptions of new varieties; at least personal observation is more satisfactory. Many of the old varieties are fully equal and often superior to the new ones, although the inexperienced buyer would hardly suspect this when reading descriptions of the novelties.

Very little budding or grafting of Roses is now done in this country in comparison with the vast numbers of these plants produced here annually, though many thousands of such plants are sent from Europe each season. These are usually distributed by means of auction-sales in the large cities. The budded plants, however, seldom prove as satisfactory as strong and healthy plants on their own roots, and, besides, being more liable to be winter-killed, do not grow with the same vigor. Many of these imported plants are used by the florists as pot-plants in flower, but are not as strong as the plants grown in the south Atlantic states, and which are own-root plants. One of the most interesting questions among the growers of Roses for market is how to get rid of eel-worms. These almost invisible pests have been shown by Professor Halsted to be the cause of the so-called club-root among Roses, and, as the measure of prevention recommended is to roast all the soil for the Roses before planting, it becomes a very serious matter to a large grower.

Other remedies suggested are various liquids to be applied to the soil after planting. These appear of doubtful value, as the worms seem able to stand quite as much as the plants.

Holmesburg, Pa.

W. H. Taplin.

The Cultivation of Blackberries and Raspberries.

IT is not an agreeable sight, after a winter of heavy snows, to find our small-fruit gardens giving no promise of a crop for the year. Really this is unnecessary. My Raspberry-canecan have come through in almost perfect order; the loss from breaking is not one per cent. This is accomplished by tying the canes in bunches of three or four above or below a wire which extends along the row. The variety I mainly grow is Cuthbert, which does well in solid rows. These rows, before I learned to tie them, were often flattened to the ground under drifts. In the spring much labor was needed to put them in order. I adopted the plan of cutting low; but while the breakage was less, the crop was also diminished. I now grow canes five or six feet high, and tie them with stout, coarse hop-twine. Our only cultivation is in the spring, when the ground is mellowed as soon as possible, and kept mellowed until the cultivator will break the growing shoots too badly. After that nothing is done except to manure the ground in the fall. The object of running the cultivator closely in spring is not so much to de-

stroy weeds as to cut up the sprouting bushes and throw all the strength of the new growth into canes in the rows. If left alone the ground between rows would be absolutely filled with young shoots. In spite of the cultivator, I am obliged in the fall to dig out superfluous canes. These are heeled in till spring, and then sold. Every grower of small fruits should have his surplus bushes and vines in shape to be disposed of at some profit. Until last year I grew my Raspberries even higher than at present, and the advantage was in shading the ground, as well as making it more convenient to pick; but I have changed my plan somewhat because the tendency was to shade too heavily the young shoots and weaken canes. The walls of berries presented on solid rows of canes tied as described is a picture.

In growing Blackberries we are compelled to take into consideration the style of growth; for some of our standard varieties send up invariably erect canes with few side shoots, while others are spreading and sprawling. Of the former kind are Snyder and Wachussetts; of the latter, Minnewaska; and between the two Erie, Agawam and Taylor. There is a decided advantage in the upright growers if you insist on cultivating between the rows. But this, after the berries have taken full possession of the soil, I abandon. They will smother weeds and grass, and no hoeing is necessary. After the second year I do nothing but cut out dead canes and shorten the tops, either in the fall or spring. The main point with Blackberries is the soil. This, if possible, should be cool, loamy and rich; but I never allow any application of barn manure. Fertilize with soil, rotted chip soil, or whatever will mulch and cool the soil. Our chief danger with Blackberries is a dry spell when the berries are approaching maturity. Of the berries now in cultivation, my choice for quality is Taylor and Agawam. Erie has not killed back this winter as it sometimes does; but it is not with me a good cropper of fine berries. Snyder is always reliable, but of moderate quality. Wilson, Jr., I see is still spoken of by some as hardy, but here it is hopelessly a failure. It kills down always, and even in the winters when peach-buds escape. Kittatinny is a noble fruit, and I get a crop from a small field by bending down the canes. Wachussetts Thornless does not differ largely from Snyder, and is entirely hardy. Few berries are badly affected by dry weather. On the whole, the key to success is cool, moist soil, not wet. If planted on high land, either mulching must be resorted to or frequent use of the cultivator. The Lucretia Dewberry is tender and must be laid down for winter and covered with leaves. In the spring I lift mine and tie to trellises. It will not pay to plant large fields. The demand for the Dewberry is, however, unlimited, but few persons are willing to incur the labor of cultivating it. The fruit is enormously large, very rich, and two weeks earlier than the high Blackberries. It will not ship to a distant market.

Clinton, N. Y.

E. P. Powell.

Insecticides and Fungicides in the Orchard.

PERHAPS I am too conservative for this progressive age, but I cannot help thinking that we are doing more spraying in our orchards now than we shall do ten years hence. There has rarely been any great scarcity of tree fruits in this country that spraying would obviate. It certainly could not have given the country a generally good crop of apples in 1890, and when there is a good blooming and the fruit sets freely, we have enough, and sometimes a good deal more than enough, as we had last year. In the off-years it will probably pay to spray our apple orchards, but in a plentiful one it would be better if we knew a good way to greatly reduce the fruitage of our trees, by a simpler method than thinning it by hand. I had all the fruit my trees would carry in 1890, being one of the few lucky ones, and I am still thankful to the Codlin-moth for the help she gave me in causing a large proportion of it to drop prematurely. I have never yet felt sure that this moth is, on the whole, a serious enemy to the careful fruit-grower. I am inclined to think that a light crop, occasionally, is a benefit to the trees as well as the market.

So much for the Codlin-moth. Spraying has no effect upon the Railroad-worm, *Trypeta pomonella*. As for the leaf and fruit fungus that causes spotting, I think the quicker we uproot every variety subject thereto, the better for us all. There are enough good sorts that do not spot, and some careful work in crossing the resisting sorts upon the best of the valuable spotting sorts, will give us practically many non-spotting duplicates. Such a duplicate, with me at least, is the Shiawassie, in place of the Fameuse. Scarcely one of the

Russian Apples is subject to this disfigurement, and by free crossing with resistant varieties we can keep clear of spot altogether. What, then, is the use of planting out these spotting varieties, when we already have so many kinds that do not spot? Spotting and cracking of our varieties of apple and pear are simply indications of a weak constitution or an imperfect adaptation to our soil or climate. We have been compelled, on this eastern slope of America, to plant the tree fruits of the western slope of Europe. It is no way surprising that many of them prove illy adapted to our climatic conditions. The severe winters and torrid summers of eastern America would be far better suited to the fruits of like latitudes from eastern Asia. Perhaps crosses between the two would be equally good; no one knows that they would not be even better. It remains a most astonishing thing to me, that the efforts to introduce these eastern European and Asiatic tree-fruits to eastern America are looked upon so indifferently, and even so scornfully, by most of our expert fruit growers, and by the great nursery firms. We have, on the western slope of our own continent, abundant proof that many of the fruits of western Europe are much more at home there than in our eastern states. The vines of western Europe have never succeeded in eastern America. The same is true of Apricots from that region, but varieties of all these fruits are growing successfully in eastern Asia, that, by all analogy, ought to suit us much better and give us more satisfactory results than we now have. True, in our middle states, the Pears, Peaches, Plums, Cherries and Apples of our transatlantic neighbors—or a sufficient number of them or of their American seedlings—are doing tolerably well, though rarely so well as in their old home. But, even where these fruits succeed, the trees are shorter-lived than the same varieties are in Europe, showing that they are not thoroughly at home with us. In fact, most of our popular and profitable varieties of Apples, Plums and Cherries, and even of our Pears, are seedlings grown in this country, and presumably a step or more on the road toward gradual acclimation to our conditions. Why adhere to a weak type when a stronger is at hand? It may be said that the Asiatic varieties are not equal to the European. No one knows this to be true. It is as yet but a hasty and bold assumption of conservative minds. But, even if true, when we have secured the vigor we may soon add to it the desired quality, and I feel very sure that when we get stronger races of tree-fruits we shall not have to wait long for quality, while we shall have constitutions vastly in advance of the old stock, and consequently greater resistance to both insects and disease.

Newport, Vt.

T. H. Hoskins.

Some Vegetable Notes.

THE last week in May or first of June is a good time in this latitude to sow Tomato-seed for a late crop. Even if the early plants, by reason of an unusually favorable season, continue to produce fruit, it is, late in the season, very inferior to that produced as the first crop on a fresh lot of plants. For canning purposes this late crop is the best of the season.

The planting of succession crops of Snap Beans should be kept up, as fast as the plants of the last sowing fairly develop leaves, until August, and in this latitude until the middle of September.

Salsify-seed sown the last of the month or the first of June will generally be better than that sown early in spring. Here, July 1st is time enough, for if sown early it will run to seed at midsummer, or at least get a check that will injure the quality of the roots.

Succession crops of Sugar Corn should be planted up to July. In this climate it is almost impossible to have early sweet corn, on account of the ravages of the Boll-worm, so we have to be content with Adam's Early in June and early July. With late Sugar Corn it is different, and we have fine ears of Stowell's Evergreen and Mammoth. Late in May is a good time to plant it, with successive plantings every two weeks until the latter part of July.

Musk-melons may still be planted. For family use we prefer the Emerald Gem, but the city-market buyers, who buy by eye mainly, will take the coarse Hackensack and even worse ones in preference.

Plants of Fottler's Brunswick Cabbage, set now, will make a fine succession crop to the Wakefield and Early Summer.

It is not yet too late to plant Okra. Aside from its value as an ingredient in soup, this is a delicious vegetable boiled and served like asparagus. It is not well to plant it too early, as it is quite sensitive to the weather, and will do better, starting after the ground has become warm.

In the south, the last of May is the best time to sow seed for

the main crop of Celery. The chief difficulty is to get the plants up at this season, and when only a few are needed, it is much better to get them grown in the north, where many plant-growers make growing of Celery-plants for southern trade a specialty. The small plants can be got in June and set a few inches apart in a cold frame, and protected by a lath screen instead of a sash.

About the first of June is a good time to put in a crop of Carrots for fall and winter use. The intermediate forms are best; the large, coarse sorts are only fit for cattle feeding.

Sugar Beets when about half-grown are good for table-use. The color looks odd, but the quality is all right so long as the roots are not overgrown. The seed may be sown any time up to the middle of June.

Raleigh, N. C.

W. F. Massey.

The Forest.

Forest Experiment Station at Santa Monica.

IN no other state of the Union are questions pertaining to forestry of more profound importance than in California. The immense bodies of timbered land in the north, the comparative treelessness of the south, and the supreme need of preserving every drop of water in all parts of the state for irrigation, give an unusual interest to every effort directed either toward the preservation of the forests we already have or to the plantation of new ones.

The work of the State Board of Forestry, though hampered by an insufficient appropriation of funds, and somewhat, also, by the usual considerations of practical politics, represents, nevertheless, a very creditable beginning of a movement which has already shown the wisdom and foresight of those who inaugurated it, and is sure to have a wide influence on the future development of the state.

One of the best-directed and most promising undertakings of the Board has been the establishment of two experiment stations, one at Chico, in the north, upon land donated by ex-Governor Bidwell; the other in the south, at Santa Monica, upon land given by Senator Jones, of Nevada and his partner, who own together some 40,000 acres of beautiful and fertile land between Los Angeles and the sea. This station comprises twelve acres, situated within half a mile of the Pacific, and includes a narrow valley with its sturdy little stream, and two benches of a few acres each, which form steps to the level table-land above, and give a desirable variety of soil and exposure. The work here is, of course, turned more particularly to the growing of such trees as are expected to be specially adapted to the southern part of the state. A large proportion of the trees are of Australian origin, and interest is centred chiefly in the two wonderful genera, Eucalyptus and Acacia, the Gums and Wattles, as they are known in Australia.

It was recently predicted by an eminent German forester, Dr. H. Mayr (GARDEN AND FOREST, vol. iii., p. 445), that in fifty years it would be inconceivable that southern California was once treeless. "Amid magnificent forests," said he, "of Australian Eucalyptus and Acacias, the visitor will be inclined to doubt that he is really in America."

Many thousand young seedlings are grown annually for gratuitous distribution, and the grounds of the station are being filled with specimen trees and with small plantations set out in various ways to test the practical value of the different methods of planting and culture. Of Gums there are some forty species represented by trees from two to three years old, and from five to thirty feet in height, which are now at the most interesting stage of growth. Eucalypts, as a rule, have a great diversity of appearance during the first two or three years of their life. The leaves and habit change as the trees grow older, and assume, to a large extent, the same general character of long, pendant, lanceolate, and more or less glaucous leaves and drooping branches, so that in old trees it is often very difficult to determine the species except by the flowers and seed-vessels. Many of the trees at Santa Monica now have both their youthful and mature forms of foliage, and many are beginning to flower—a precocity certainly remarkable in trees which grow to such an immense size.

The foremost of the Eucalypti as regards the number grown in California is the *E. globulus*. The cultivation of this species has passed the experimental stage, since it is grown by nurserymen by millions annually, and is planted throughout the state, sometimes in groves quite large enough to be called forests. The extremely rapid growth of this tree, and the high price of fuel, make it a profitable investment for planting. A

tree of this species, recently cut at Santa Barbara, three years and nine months old from the seed, measured forty-three feet ten inches in height and eight and three-quarter inches in diameter at the butt. This tree was not an isolated specimen, but was in the midst of a grove planted eight feet apart each way.

The Red Gum (*E. rostrata*) is also established in California. Its growth is less rapid than that of the Blue Gum (*E. globulus*), but its lumber is more valuable. The wood is stronger, more easily worked, and more durable for such uses as posts, telegraph-poles, railroad-ties, and especially for piles, since it is not attacked by the Teredo.

Aside from these two species, but few of the many excellent Eucalypts were generally known here until brought into popular notice by the efforts of the State Board of Forestry. There have now been distributed through the state from Santa Monica a large number of new species worthy of attention for the different qualities they possess. Specimens of these at the station are already large enough to show indications of their value, and to give some useful hints to those desiring to plant.

Among the more noteworthy is the Sugar Gum (*E. corynocalyx*), a tree of rapid growth and handsome appearance. It is more umbrageous than most Gums, and produces a hard, strong wood, remarkable for its durability under ground. The chief merit of this tree, however, is its adaptability to the most arid localities. It has been recommended by Baron von Müller for planting in the Algerian regions of the Sahara, and has succeeded well in southern California on dry and rocky foot-hills impossible to cultivate. A specimen of this species grew during its second year from planting from eight and a half to nineteen feet in height.

E. viminalis, the Manna Gum, is one of the hardiest species, and has been extensively distributed to the cooler districts of the state. It will stand for a short time without injury, according to Monsieur Naudin, a temperature as low as fourteen degrees, Fahrenheit. Though a shapely tree for avenue-planting, and almost as rapid in growth as *E. globulus*, its wood is softer and less valuable than that of many other species. The custom is almost universal among the nurserymen here to sell this tree as *E. rostrata*.

E. marginata, the Yarrah, which is famous for the resistance of its wood to attacks of the Teredo when used for piling, and which forms such extensive and valuable forests in west Australia, has proved of rather slow growth at Santa Monica. Its increase in height does not exceed two or three feet in a year.

The station has a number of fine specimens of *E. amygdalina* and *E. diversicolor*, trees which, in their native soil, according to Von Müller, sometimes grow to a height of over four hundred feet, overtopping, perhaps, our giant Sequoias.

The handsomest of all the species at Santa Monica, at least in their present stage of growth, is *E. polyanthema*, or Gray Box. Its upright form and dense foliage at once distinguish it, but its chief beauty is in the delicate pearly gray color of the leaves, which, in the young growth, is almost lavender. On young trees the leaves are nearly round, and are gracefully curved. While not growing so rapidly as some others of the genus, the Gray Box produces very valuable timber, and has shown a capacity to resist extreme drought.

Next in order of interest to the experiments with the Gums are those which have been made with the Wattles, or Acacias. The Black Wattle (*Acacia decurrens*) is a specially noteworthy tree, as remarkable for its wonderful rapidity of growth as for its extraordinary beauty. But its chief claim to attention is in the value of the bark for tanning leather. The Golden Wattle (*A. pycnantha*), though not growing quite as fast, produces a bark still richer in tanning qualities. Thoroughly dried specimens have frequently yielded to a chemical test over thirty-six per cent. of tannic acid. These trees promise to give to California a plentiful supply of tanning material. The bark of the Chestnut Oak already commands \$16.00 or \$17.00 per cord in San Francisco, and the supply has yearly to be obtained from less accessible places. The tanners of the Coast appreciate the importance of the subject, and have shown considerable interest in the experiments of the board looking toward the more extensive introduction of the Wattles. In Australia and New Zealand the cultivation of these trees is rapidly spreading, some plantations containing as many as 3,000 acres, and apparently giving satisfactory returns. The trees are ready to strip when from five to seven years old, and an acre containing 1,000 trees is expected to yield over five tons of bark, valued at \$35.00 or \$40.00 per ton. The wood of the Wattles is used in Australia for spokes, staves, etc., and it makes excellent fuel.

Both these trees are very floriferous, and when in flower are masses of yellow bloom, the fragrant little golden balls hanging in innumerable racemes from every part of the trees. The Black Wattle seems to possess about the same degree of hardness as *Eucalyptus globulus*. The Golden Wattle is more tender, but will do well in localities of extreme aridity, and is contented with a very poor soil. These trees being somewhat difficult to transplant, the experiment has been tried of planting the seed in cuttings of bamboo or cane four or five inches long, set up on end and filled with earth. One or two seeds are planted in each tube. When the trees are six or eight inches high they are easily transferred to the field, tube and all, without disturbing the roots, and the cuttings of bamboo are left to decay.

Another noteworthy tree is the Blackwood (*A. melanoxylon*). Its symmetrical shape, dense foliage and abundance of flowers make it a very desirable tree for avenue-planting, while the wood, much resembling that of the Black Walnut, is highly esteemed in Australia for cabinet-making. The Blackwood, like the Golden Wattle, belongs to the wonderful phyllodineous Acacias, no less interesting morphologically than they are curious to the most careless observer. The leaves on the young tree for the first few months are soft, feathery and bipinnate. The leaf-stalks soon begin to broaden and lengthen out, until at last they become the somewhat stiff, leathery phyllodia which form the foliage of the mature tree, though sometimes retaining upon their tips, for two or three years, remnants of the bipinnate leaves of their youth.

These are a few of the more important of the many interesting trees which are being brought to the attention of California planters by the experiments at Santa Monica. The station is in charge of Mr. Wm. S. Lyon, an accomplished botanist and an enthusiastic tester of trees, whose pen has, moreover, done much to bring about a proper public sentiment in regard to all questions relating to the forestry-interests of the state.

Montecito, Cal.

Frank M. Gallaher.

Recent Publications.

Traité des Arbres et Arbrisseaux, Forestiers, Industriels et d'Ornement, Cultivés ou Exploités en Europe et plus particulièrement en France, donnant la Description et l'Utilisation d'environ 1,800 espèces et 1,000 variétés. P. Mouillefert. Paris, Paul Klincksieck. 1891.

The object of this work, which is appearing in parts and which we should judge was about one-quarter finished, is to furnish a brief account of the trees and shrubs which grow spontaneously or are cultivated in Europe and principally in the territory of France. The author is a well-known and learned dendrologist and Professor of Sylviculture in the National School of Agriculture of Grignon, where a well-arranged arboretum is maintained under his direction.

The works of comprehensive scope devoted to the elucidation of cultivated ligneous plants which have previously appeared in the present century is that of Loiseleur, a French botanist, who published in its early years a classical treatise on trees and shrubs usually known as the *Nouveau Duhamel*, it being regarded as an enlargement and continuation of the *Traité* of Duhamel, the great French dendrologist of the eighteenth century (Loiseleur's work is in seven folio volumes, sumptuously illustrated with colored plates, and has become so rare and expensive that many cultivators of trees are prevented from consulting it); the exhaustive and indispensable *Arboretum et Fruiticetum Britannicum* of Loudon, published fifty years ago and before the introduction into gardens of many of the plants now cultivated, especially those of western North and South America, Mexico, Japan, Australia and New Zealand; and the *Dendrologie* of the German, C. Koch, published from 1869 to 1872, and exclusively devoted to an account of the woody plants cultivated in northern and central Europe. The time then had come in France for a comprehensive work on the subject which should include, besides the familiar trees and shrubs of the gardens of Paris and of the north of France, the innumerable forms of woody vegetation which have been brought from all the dry temperate and subtropical regions of the world into the gardens of Provence.

The plan of Professor Mouillefert's work, as explained by the author, who has devoted many years to preparing himself for his task, embraces a brief history of all the principal trees, native or exotic, found in Europe growing spontaneously in forests, in dendrological collections like those found in the botanic gardens of all European cities, and in public gardens and parks; and also of the shrubs most commonly cultivated in orangeries and greenhouses—that is to say, all woody plants cultivated in

forests and gardens. Of such plants the author estimates the number of species as from eighteen hundred to nineteen hundred with eight hundred or nine hundred varieties.

The systematic catalogue is prefaced by an introduction, containing a brief treatise on those departments of botany which must be understood in order that trees may be studied intelligently, to which is added a list of technical expressions used in the work and eleven plates illustrating the form of cells, the structure of tissues and of wood, the various forms of leaves, and the different sorts of inflorescences and of fruits. Coming to the catalogue itself we find that the history of each plant is composed of four principal parts. The first is devoted to the origin and the geographical range of the species; in the second the principal botanical characters which distinguish the species are given in simple language, the author wisely confining his descriptive matter to the essential or differential characters which may be relied on to distinguish a plant of the particular species from the best-known species or type of the genus, in this way avoiding needless repetitions and bringing out the salient characters of each plant. The third part treats of the soil and exposure best suited to develop the plant in question, with notes on methods of propagating it; and in the fourth part is set forth the nature of the products—that is, the wood, the fruit, the bark, etc.—with notes on its value from the ornamental or from a sylvicultural point of view. An atlas or thirty-two colored plates accompanies the work, illustrating representatives of the principal groups, each plate displaying as far as possible a branch in flower and in fruit, a flower with its principal organs, an entire fruit and a fruit in section, and the seed. Besides these colored plates, the work is further enriched by one hundred and eighty-nine plates, reproduced from photographs, made by the author, of cultivated trees in different parts of France. These usually represent trees without leaves that their appearance in winter may be made familiar.

On the whole, the treatment of the subject so far as the result of Professor Mouillefert's observations have been published is good, although, as is generally the case with botanists working with plants represented by cultivated individuals exclusively, the number of species in some genera is unnecessarily enlarged, and too much attention is often paid to ephemeral varieties of little morphological or horticultural value; and "book species," which would disappear in the course of a critical study of all the members of the genus in their wild state, are too frequently admitted, as is perhaps inevitable in a work of this character. But, after all, Professor Mouillefert does not pretend to present his readers with an exhaustive study of the wild types of all the trees and shrubs cultivated in Europe, and confines himself to a treatise on the cultivated plants themselves as they appear in French gardens. This he has so far succeeded in doing in an acceptable and most useful manner, and we can recommend his work to all persons familiar with French who occupy themselves for profit or for pleasure with the cultivation of woody plants.

Notes.

The Société Nationale d'Agriculture de France, at a recent meeting held in Paris, awarded its gold medal, stamped with the portrait of Olivier de Serres, to Professor Sargent's *Silva of North America*, now being published by Houghton, Mifflin & Co.

According to the *Zeitung*, of Cologne, the owner of a Cherry-tree, which stood upon a piece of ground required for the enlargement of the railroad station at the village of Niederlahnstein, was recently paid \$600 for the tree in addition to the value of the land, and accepted this sum only after a long contention, declaring that the tree was worth at least \$900.

In the mid-May issue of the *Revue Horticole* a portrait appears of *Deutzia parviflora*, the most beautiful species, perhaps, of the genus, one of the best hardy shrubs in cultivation, and a native of Manchuria. It has recently reached the gardens of western Europe as it now appears through the Arnold Arboretum, which received it many years ago from the Botanic Garden at St. Petersburg.

A correspondent sends us from Boston flowers of the double form of the beautiful Cuckoo-flower (*Cardamine pratensis*), which has recently been found near Woburn, in Massachusetts, where it has become naturalized and covers a considerable area. This plant, which is rare in the eastern states, is also a native of Europe, where the double-flowered form is said to be not uncommon.

The growers of Tuberoses in eastern North Carolina, who have been for some years supplying the market with these plants, are much discouraged by the decreased demand and low prices for their bulbs. It has been suggested that their soil and climate are remarkably adapted to the growth of Roman Hyacinth, Narcissus and Lily bulbs. The whole tribe of Narcissus, now imported in such quantities, can be grown there in great perfection.

Mr. H. J. Webber, the author of a *Catalogue of the Flora of Nebraska*, which was published in 1890, has since found cause to make some corrections in his list and to enlarge it considerably, and has therefore written an appendix, which has just been reprinted from the *Transactions of the Academy of Sciences of St. Louis*. It mentions 432 species, not hitherto reported, from Nebraska, making the whole flora of the state, as thus far known, to include 2,322 species and varieties.

Mr. Samuel B. Duryea, of Brooklyn, well known for his intelligent interest in the park system of that city, has recently presented to it a tract of eight acres, extending for more than five hundred feet along the water-front and adjacent to the proposed shore-road to Fort Hamilton, on condition that this driveway, which, when completed, should be one of the finest ocean-drives in the world, is at once laid out and constructed as provided for in a recent act of the Assembly.

In June, 1890, the alpine experimental garden on the Brocken, in the Hartz Mountains, had been planted with two hundred species of alpine and Arctic plants and Siberian and North American conifers. Late in the autumn of the same year it was found that only six of these species had perished, while a number, in this their first summer, had blossomed and borne fruit. The unusually heavy snow-fall of the winter of 1890-1891 did not decrease the list, and since then about two hundred additional species have been planted.

From experiments made at the agricultural station of the Maine State College it has been found that disturbing the roots of Cabbage in transplanting appears to have no marked effect on the size of the head, and that the best results are obtained by frequent transplanting. A good Cabbage has a short stem; the leaves placed close together with short petioles, thus leaving little open space about the stem. The blade should be large enough to extend more than half-way around the head, to avoid the soft spot often seen in the centre. Firm, solid heads are less subject to the attacks of the cabbage-worm than loose, open ones.

Gartenflora recommends the winter-feeding of birds by fruit-cultivators, as a means of decreasing the ravages of insects on their trees. In many parts of Austria, it says, at the approach of winter, a circle of evergreen-branches is formed by sticking their butts firmly in the earth. The ground within the circle is covered by boards, and then other branches are laid across, so as to form a light roof for the enclosure. Seeds, bread crumbs, etc., are scattered on the boards, and the birds, quickly finding their way to the food through the interstices of the evergreens, are protected against wind, snow and the attacks of animals, and in the spring are ready to pay their debt by vigorous assaults upon the insects of the orchard.

It is pleasant to find that in *Far and Near*, the excellent and interesting monthly journal which is edited in this city by Miss Chapin for the Association of Working Girls' Societies, frequent attention is paid to the way in which plants and flowers can augment the joy of existence, even among the toilers in large towns. A year ago this journal contained a wisely suggestive article on roof gardens—a subject which has since been brought to general attention in our daily papers, and in the current number for May we note a very good paper by Miss Newell, called the "Growth of Spring Flowers," which is a simple account of the manner in which plants awaken to life in the spring, illustrated by an analysis of the Violet, with directions how to examine its internal structure. Such readers as had heretofore admired only the more obvious beauty of flowers, without noticing their hidden charms of structure, or considering their manner of development, ought to be won to a new and deeper interest by this simple lesson, and it is to be hoped that the writer will continue her teaching in *Far and Near*, taking up other familiar flowers in their successive seasons.

A few of the gardens in the immediate neighborhood of Boston have been beautiful from the profuse flowering of the various forms of small Apple-trees which have been introduced into them principally through the agency of the Arnold Arboretum. It is surprising that these plants are not better known and more generally planted. When in flower no trees are more beauti-

ful; they are perfectly hardy, and flower freely every year; they improve with age, and are unattacked by disfiguring insects with the exception of Tent-caterpillars; they grow rapidly, and, once established, never fail to flower. Many of them, too, are beautiful in the autumn and winter, owing to the abundant and often showy fruit which covers their branches. The most desirable are forms of the widely distributed and polymorphous *Pyrus baccata*, a native of eastern and northern Asia, and of these forms the most beautiful, perhaps, is the plant sold in nurseries as *P. Malus floribunda*, a favorite in Japanese gardens, whence, some twenty years ago, it was introduced into Europe by Siebold. This plant is particularly beautiful before the flowers expand, as the flower-buds are bright red; when these open they disclose the white inner surface of the petals, which make a charming contrast with the red buds nearer the extremity of the branches. Other varieties produce pure white flowers, and the plant known in gardens as *P. Parkmanni* or *P. Halliana*, rosy pink semi-double flowers, which hang on long red stalks. Hardly less beautiful is the Chinese *P. spectabilis* with semi-double pink flowers, and the Siberian Crab (*P. prunifolia*), with white or rose colored flowers. These are followed by our native species, *P. coronaria*, the latest of all the Apples to bloom, and distinguished by the delicious fragrance of its large pink flowers. No garden of hardy plants in the northern states is complete without a collection of these little trees, which, to display their full beauty, require good soil and abundant space for the development of their spreading branches.

When the opinion was generally held that the Sugar-cane never produced seed, it was believed that the numerous varieties which existed in the world had originated by bud variation. Since the discovery, or rediscovery, of the seminal fertility of the cane it has been found that seedlings of recorded parentage show in most cases some characteristics of relationship to the parent stock; nevertheless the variation is wide, and there is no doubt, from what has been learned in the past few years, that the different varieties of cultivated cane have come from self-sown seeds which sprang up and produced plants which were unobserved during the first year or two of their growth. Of course, this tendency of seedlings to vary is the essential condition of possible improvement under cultivation, and undoubtedly the cane will now be improved under the hands of careful cultivators and breeders of new types. The process of selection, however, must be slow, because seedling canes take, as a rule, two years to mature. The cane flowers in the autumn, and the majority of the seedlings even of an early variety, will need fully twelve months before they can flower. In the botanical gardens of British Guiana, as we learn from a late report, seedlings have been produced with stalks not larger than a stout lead-pencil and weighing only two or three ounces each. On the other hand, the largest variety has grown to a height of more than twenty feet, with fifteen feet of clear cane to each mature stalk, each one weighing as many pounds—that is to say, each foot-length of cane averages a pound in weight, and the total weight of canes from one stool was at least 650 pounds. Some seeds of the smaller varieties show a remarkable tendency both to reversion and improvement. Seedlings from the same parent cane in the same season have yielded plants ranging from a stalk weighing but six ounces, when topped, to one weighing seventy-six pounds. This means that if these plants were set as usual, at the rate of 2,178 to the acre, the former would produce 817 pounds, while the latter would yield seventy-four tons.

The death of the Abbé Léon Provancher, in his seventy-second year, occurred not long ago. He was born at Becancour, in the Province of Quebec, in 1820, and for some years was the curé of Portneuf. Compelled by delicate health to retire from the active duties of his ministry, he settled at Cap Rouge, near Quebec, and devoted the remainder of his life to the study of natural science. In 1869 Provancher commenced the publication of the *Naturaliste Canadien*, of which twenty volumes appeared, and was then abandoned owing to the refusal of the Government of Quebec to continue the annual grant which had made its existence possible. Provancher, who published much on entomology, is known to botanists by an elementary treatise on that science, published in 1858, and by his *Flore Canadienne*, a comprehensive work, published in 1862. Later he began the publication of his *Fauna Entomologique du Canada*, of which three volumes were completed. His writings include also an account of a pilgrimage to Jerusalem, a journey in the West Indies, and treatises on agriculture. He was the author of many new species and genera of insects, particularly of Hymenoptera and Hemiptera.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLES:—The Beauty of Our Trees in Spring.....	265
Bulbous Plants in Grass.....	266
Practical Forestry..... <i>John D. Lyman.</i>	266
May in West Virginia..... <i>Mrs. Danske Dandridge.</i>	267
The Raisin Industry in California..... <i>T. Goodman.</i>	268
NEW OR LITTLE-KNOWN PLANTS:— <i>Boltonia latifolia.</i> (With figure.).... <i>C. S. S.</i>	268
New Orchids..... <i>R. A. Kofe.</i>	268
FOREIGN CORRESPONDENCE:—The Experiment Garden at Wisley in England.. <i>V. C.</i>	269
CULTURAL DEPARTMENT:—Hardy Narcissus..... <i>O.</i>	270
The Rock-garden..... <i>M. Barker.</i>	272
Garden Notes..... <i>E. P. Powell.</i>	272
The Garden in May..... <i>F. N. Gerard.</i>	273
The Bachelor's Button..... <i>M. Barker.</i>	273
CORRESPONDENCE:—The Winter-killing of Conifers, <i>Jackson Dawson, Fred. W. Kelsey.</i>	273
The Waukegan Nurseries..... <i>S.</i>	274
RECENT PUBLICATIONS.....	275
NOTES.....	275
ILLUSTRATION:— <i>Boltonia latifolia</i> , Fig. 51.....	274

The Beauty of Our Trees in Spring.

FOR three centuries the splendor of the autumn colors of the American forest has been a favorite theme with the writers on the beauties of nature. Little, however, has been said of the peculiar beauties of our trees in early spring, and probably few persons, except the elect who worship in the inner temple of nature, recognize the subtle charm of our woods at this season or realize the variety and harmony of the apparel which our trees put on to celebrate the return of the vernal season. Here at the north in no other month are trees more beautiful than in May, when more clearly, than later in the year, appears the contrast between a forest of many species grouped as nature alone knows how to blend various distinct forms and many distinct shades of colors in one harmonious whole, and forests like those of Europe composed of a few species only. In May, from the top of a New England hill, or better, from one of the high summits of the southern Alleghanies, over which is spread the most varied, luxuriant and magnificent collection of deciduous trees in the world, may be seen the American forest in its most charming aspect, the outlines of individual trees veiled, but not hidden, by the opening leaves, which vary on each species in tone and color. This first flush of woodland beauty lasts only a few days, but they are precious days to the lover of the forest and to the student of individual trees, for the one can delight his eyes and study the harmonies of nature, and the other learn of characters, as constant as the structure of flowers or fruit, which will aid him in distinguishing the different species, for each may be recognized in early spring by the appearance of the very young leaves or of the scales of the leaf-buds, which on many trees in unfolding lengthen and assume bright colors. This is the case with the Horse-chestnuts, with many Maples, with all the trees of the Rose family, especially the Plums, Cherries and Hawthorns, and with all the Hickories, whose bud-scales grow to a great size before falling.

The vernal parade is led by the Red Maple and the White Maple; it is, however, with brilliant flowers, and not with unfolding leaves, that these celebrate the coming of spring, and before the leaves of these two trees unfold their flowers have fallen, and the brilliant scarlet fruit of the Red Maple has grown to its full size. Certainly one of the most beautiful objects to be seen in our woods in early spring is a Red Maple covered with fruit, which varies in brilliancy on different individuals, and at the north sometimes suffers from frosts which destroy the flowers. In southern Arkansas, Louisiana and Texas, where a variety of this tree grows with large and brilliantly colored fruit which frosts rarely injure, in March the Red Maple growing among the broad-leaved evergreens, which are common in that part of the country, is seen at its best, making a note of color in the landscape, and a sensation on the mind which time does not dull.

In northern woods the Amelanchiers are conspicuous in early spring by the colors of their unfolding leaves; in one form these are red, in another silvery white, and their vernal beauty is increased by brilliant scarlet bud-scales and bracts and by the silky white hairs which clothe the young growth. Of the delicate beauty of the flowers of this tree it is not necessary to speak, for every one who walks abroad in early spring knows the white flowers of the Shad-bush, which in April and early May enliven the banks of swamps and upland woods all over eastern America. Not less beautiful, perhaps, although less conspicuous and less familiar to the unpracticed eye, is the opening of their leaf-buds, which precedes the unfolding of the flowers. Among smaller trees the red shoots and young leaves of the Stag-horn Sumach and the deep bronze-green of the unfolding leaves of the Sheep-berry (*Viburnum Lentago*) add variety and charm to road-sides and forest-copses. Every one knows the tender green of the young foliage of the Beech, the most delicately vernal green of the forest, but this tree is well worth careful examination in early spring, when the expanding bud-scales are brilliant in color and the lengthening shoots and unfolding leaves are covered with soft pale hairs.

But the Oaks, perhaps, will best repay study in early spring; they make up a large part of our eastern forest-growth, and it is their variety and the peculiarity of each species that gives the character to our forest-scenery. Each species in early spring is distinct in color and in tone, and it is by the blending of these elements into a composition of perfect harmony that Nature shows how pictures may be composed, and how variety within certain limits is necessary if the greatest beauty of the landscape is to be obtained.

The earliest of our northern Oaks to spread its foliage is the Red Oak; the young leaves are yellow-green, in tint not very unlike that of the Beech, and are half-grown before the opening of the flowers which during a week in May make the trees great yellow bouquets. Rather later the Black Oak unfolds its leaves; at first they are bright scarlet on their upper surface, the under surface being covered with a pale coat of white wool. The red color gradually fades, and at the end of a few days they are light yellow-green. It is the Black Oak that in spring gives the soft hazy appearance to upland Oak-woods, although at one period of their development the leaves of the White Oak are not very different in color; these when they appear are sometimes bright red and sometimes delicate gray or mouse color, although before the flowers, which open late, appear they are more than half-grown and soft light green. The young leaves of the Bur Oak are orange and those of the Chestnut Oaks are light green. The Bear Oak is one of the most beautiful of all our plants in spring; the leaves are red until they are half-grown and until after the appearance of the bright yellow flowers.

We cannot pretend to describe even in the briefest and most unsatisfactory manner the vernal beauty of all our trees, or do more now than mention the grace of the Birches at this season of the year, the tender yellow-green of

the Sassafras, the sturdy unfolding buds of the Hickories, the red tints spread over the leaves of the wild Cherries, the beauty of the vernal Hornbeam and Hop Hornbeam, of the late-flowering Maples, of the Ashes, the Locusts, the Elms and the Hackberry, or of the conifers of which each species signals the return of summer in its peculiar way. A volume might well be written on the vernal characters and beauties of the trees of eastern America, but all we can hope to do now is to point out a woodland path, where there is much to be seen and many things to learn for the man who knows how to see, in the belief that he who does not know trees in spring and has not watched the early stages of their yearly growth has lost one of the best pleasures of life and missed one of the benefits which we Americans have in living in a country of such varied, interesting and beautiful forests that the forests of all other temperate lands are in comparison tame and uninteresting.

A WRITER in *The London Field* discussing the attempts which have been made in recent years to introduce bulbous plants into the grassy slopes of the Royal Gardens at Kew, sensibly calls attention to the fact that, "in such a vast garden there are many opportunities of carrying out this excellent system, particularly where the branches of trees touch the ground. In every one of such cases some of the delightful early flowers might be in position, the sheltered ground around such trees being exactly what many bulbs delight in. Hitherto use has been made of popular flowers well known in gardens, but this system may enable us to use with effect beautiful flowers that have not been generally considered worthy of cultivation in gardens—flowers which perhaps looked at in the hand are not so attractive as Lilies or Daffodils, but which might furnish new effects when seen in quantity. We mean such flowers as the less showy sorts of the Star of Bethlehem, Gazea, and even Allium, Fritillaria, European Gladioli, Grape Hyacinths, which we find thrive freely in grass, and the species of wild Tulip which are rarely seen in all their force of color, and also some of the beautiful and less showy spring flowers which might be used more freely, such as the Snowflake, principally the spring variety; St. Bruno's Lily in the rich grass is delightful, and the Dog-tooth Violet, which thrives in grass, and which, however dwarfed and starved, is always beautiful. The contrast between short turf and the waving grass full of flowers will be delightful. In the hot days of spring, flowers so often pass quickly away that it is a great advantage not to have to disturb the whole garden for them, whereas in the grass they are not in the way, and in the wild garden one bulb may succeed another, which is not so easy in the regular garden."

Certainly there is no more delightful form of gardening than this, or one which can be more easily executed if proper care is taken in selecting the plants to be used and in planting them. The essential thing in wild-gardening is the selection of the plants. These must look as if they were or might be wild, that is, they must harmonize with their surroundings. A stately garden Tulip or a monstrous garden Hyacinth looks out of place if it is seen by a wild wood-walk or in a field of waving grass, just as a great double-flowered Pæony looks out of place anywhere but in a garden-border. For natural planting, wild forms, or forms which have suffered little change by cultivation, are essential, although it is perhaps our association of such garden-plants with trim beds or borders rather than any inherent unfitness in the plants themselves that makes them appear out of place outside the garden proper.

Grass must be cut even by the borders of the wood-walk, although the operation may be delayed perhaps until July, so that it is necessary to select plants to plant in the grass that ripen their foliage early in the season, unless it is proposed to replant them every year. The Snowdrop, and the Crocus, especially white and yellow flowered varieties, can be used to advan-

tage in this way. All the Narcissi look well in the grass, and ripen their foliage early, although the Poet's Narcissus appears to thrive in grass better than any of the yellow-flowered varieties, and is perhaps the best of all plants to use in this way. With it will bloom the Blue Bell or Wild Hyacinth (*Scilla nutans*), a charming plant with flowers which are sometimes pink or white as well as bright blue. Some of the small-flowered wild Tulips, like *Tulipa Persica*, look well in the grass, as does the Star of Bethlehem, which has become naturalized in some parts of the country, and the Grape Hyacinth. All the Buttercups are beautiful in the grass, and so are our native Iris if the ground is moist enough to insure their vigorous growth. The list of plants, however, which can be used in this way is not a very long one, although among our native plants there are probably a few that can be seen to their best advantage in this way, and we recall a bank from which the grass is cut every year in June for hay, on which the Cuckoo-flower (*Cardamine pratensis*) has held its own for years, and gradually spread over such an area that now its lovely pale lilac flowers make a brave show as they gradually unfold during the last two weeks of May.

Practical Forestry.

THE following account of an experiment in growing White Pines in Durham, New Hampshire, by the Hon. John D. Lyman, of Exeter, appeared in a recent number of *The American Cultivator*:

In the year 1870 I purchased the abandoned Pike Farm. Some two or three years afterward I noticed about an acre of little Pines growing very thickly upon the land. In their condition at that time they had no market value. Mr. I. P. Berry, the treasurer of Strafford County, who thinned these trees for me, said that the acre of land with the little Pines would not then have sold for \$3.00. The process of thinning out was commenced about eighteen years ago, and has been continued at various times since, but the growth has never been sufficiently thinned, and even now numbers 178 trees. I think there should not be over 100 trees at this stage of growth.

For the purpose of thinning I recently cut one of the smallest, most crowded and oldest trees. This tree had once lost its main top, which, of course, checked its growth for several years, and it has been so much crowded that during the past ten years its growth has been very slow. Yet this tree was seventy-seven and a half feet in height, measured thirteen inches across its stump, and nineteen inches in circumference fifty-seven feet from the ground. I measured the circumference of the trees four feet from the ground, standing nearest a straight line drawn through the centre of the lot, and found the average to be a little over forty inches. One tree standing on the edge, and not included in those which averaged forty inches in circumference, girdled seventy-four inches four feet from the ground. This one, of course, is "limby" on the side toward the cleared land.

As these Pines came up very thickly, they had no large, low limbs. Their small limbs died for quite a distance from the ground. Several years ago I removed these dead limbs, leaving none within about twelve feet of the ground. Not being able to secure a suitable saw in Boston, I had one made from a wood-saw, and at an outlay of about three cents a tree I have lately had these dead limbs taken off, say eighteen or twenty feet from the ground. My object is not to promote growth, but to prevent loose, black knots in the boards. I presume it is generally known that while the Pine-limb is alive the knot is of a reddish hue and secured fast to the wood, but after the limb dies the annual growth of the trunk pushes out over the dead limb, and this part of the knot is black and often so loose as to fall out and leave a hole in the board when sawed from the log. The difference in value between clear pine boards and those abounding in knots, and especially in black, loose knots and knot-holes, is well understood by those who buy and sell lumber. In my experiments I am attempting to grow good lumber, instead of knotty, cheap lumber.

The greatest number of rings (these generally correctly indicate the age of the tree) which I have ever found in any Pine in the clump of which I am writing was forty-five. This number of rings I found in the tree lately cut. As its height was seventy-seven and one-half feet, the annual gain in height was twenty and two-thirds inches, presuming the tree to be forty-five years of age.

The fencing, shingle stuff and small timber taken from this clump in the process of thinning have very liberally paid all expenses. Had this acre been left entirely to nature and nature's methods of growth, there would have been at this time some seventy cords of wood upon it, which for fuel would have paid little or nothing over operating expenses at present market values. The border trees, and a few others, would have made small timber or box boards of little value.

I have never seen the groves of trees set out by the wealthy Massachusetts amateurs, Mr. Fay, of Boston, and others, but I think they would have found their investments more profitable had they properly thinned their groves from time to time. Thinning requires judgment and experience. The scorching of the trees by the sudden admission of sunshine upon the tender bark is to be avoided. The danger from wind is to be guarded against. If the trees are too far apart they grow too "limby," and if left too close they grow too slim and too slowly.

One of the first points to be learned in order to grow a crop, whether of timber, corn, or any other, is the number of plants to the acre which will produce the best results. Thus, too many corn-plants give nubbins, or no ears at all; too many potato-stalks give small potatoes; too many tree-plants give poles instead of timber. Years ago, my idea was to have Pines for timber trees very thickly set when young, so as to prevent large lower limbs. This theory proves to be a correct one. I then thought to thin out many times until the trees were about forty-five years of age, and then to leave one hundred to the acre until they were about sixty years of age, when I expected the trees to average each the equivalent of five hundred feet of inch boards, or fifty thousand feet of inch lumber to the acre. I then proposed cutting the whole or thinning again. After years of observation, I think I was about right at that time, though perhaps eighty Pine-trees to the acre, at forty-five years of age, would prove more profitable than one hundred.

B. E. Fernow, Chief of the Forestry Division of the Department of Agriculture, in Official Bulletin No. 5 on Forestry, states that 270 is in general the right number of timber trees to stand to the acre 100 years for timber. If this theory is correct, I am far from right in practice. Pines take less room than Oaks and other branching trees. I have studied nature and her ways without avail if 270 White Pine-trees is the proper number to be grown to the acre for timber until a hundred years of age. I have with measuring-line traversed our forests, and carefully studied their growths, and have consulted many owners of forests and many lumber operators, who have hundreds of acres of Pine-trees, but I find not one of them confirming the theory of growing as many trees to the acre as is recommended by the Chief of the Forestry Division.

The White Pine (*Pinus Strobus*) a hundred years in growing should certainly make 1,000 feet of inch boards at the mill, and thus we should have 270,000 feet of inch lumber to the acre, or an average growth of 2,700 feet per acre each year of the hundred. This is far beyond any growth to be found in my section. In my experience while lumbering I never cut 100,000 feet board measure upon any one acre. Set in regular squares, 270 trees to the acre would stand a little over twelve and a half feet apart from centre to centre of trees. I can find no two Pines of considerable size and thriftiness standing thus near to each other, with any considerable number of live limbs on the sides facing each other. Nor can I find such a Pine surrounded by trees equally high, and only thirteen feet distant.

One of my last object-lessons in forestry from nature was in the grand old woods upon the agricultural college farm in Durham, New Hampshire. The land is good, at a very low altitude, and all the conditions are favorable for tree-growth which has been undisturbed for 140 to 150 years. Professor Pettee, of the college, selected, at my request, what he considered as good an acre of Pine-timber as the forest contained. Upon that measured acre we found 156 live trees and thirty-four dead ones, including those which had already died and fallen. Their circumference four feet from the ground varied from twenty-two to ninety-eight inches. Two of these 190 trees were Birches, two White Oaks, one Maple, ninety Hemlocks, while the balance were White Pines. The average circumference of the 190 trees four feet from the ground is fifty-four inches and a fraction. The clump of New Durham Pines belonging to me has more than half as much timber to the acre as has the acre at Durham College, and will, barring accidents, by the time the trees are one-half the age of the Durham trees, have not only more timber to the acre, but of better quality.

This shows the advantage of aiding nature in the production of timber, the same as in the production of other crops, and proves the profits of practical forestry. Why did the thirty-four trees on the Durham tract die? With very few exceptions, I have no doubt they were shaded to death by the other

trees, although there were only 190 trees to the acre. A Hemlock-tree will grow in the shade where a White Pine-tree will die, and hence I presume by mixing Hemlocks and White Pines, as is the case in Durham, more trees can be grown to the acre than there could be of White Pines alone.

[After the extracts which we have quoted from Mr. Lyman's article were in the form for printing we received a note from Mr. Fernow, expressing the hope that he may find time soon to give our readers his views on the growing space which is needed by forest-trees.—ED.]

May in West Virginia.

STILL the Roses tarry, though a few are opening here and there. The Ramanas Rose, *Rosa rugosa*, is an early bloomer, with large, showy, single flowers of a bright crimson. They are very fragrant. It is delightful to know that no insect finds its handsome foliage toothsome; this fact makes *R. rugosa* especially valuable in the shrubbery. Madame George Bruant, which is a beautiful White Rose of Tea and *Rugosa* parentage, does not possess the acidity of foliage which is the protection of the Ramanas Rose, and the slugs feed upon it unless deterred by copious doses of hellebore or slug-shot.

Cinnamon Roses are now rioting over the garden, mingling their fragrance with that of the Mock Oranges, Locust blooms and Yellow Lilies. *Valeriana officinalis*, or Mountain Heliotrope, as it is called in this neighborhood, grows freely in the Lily-beds and has a refreshing and quieting perfume. This may be only imagination, but it is true that different perfumes affect the nerves in various ways. Thus the odor of Mock Orange, or Philadelphia, is overpowering to many people whom the breath of Lilies-of-the-valley, of Heliotrope, and the delicate fragrance of Roses and Honeysuckle thrill with delight.

Staphylea Colchica has a very powerful perfume suggesting Orange-flowers. It makes a handsome bush with its small, trifoliate shining leaves and pure white blossoms succeeded by bladderly pads. This *Staphylia* is now blooming and is much later than its American relative, *S. trifolia*.

Scotch Broom is one of the most showy members of the Pulse family. To-day it is shining with bloom. The leaves are wet from a heavy shower, and standing in full sunshine, the whole plant sparkles joyously, fairly lighting up its corner of the shrubbery, and even surpassing the Laburnums, which are flowering very sparsely. *Coluteas* are also coming into bloom. The Pulse family has representatives that extend the blossoming season for these plants from May until late in the autumn. Perhaps the familiar Sweet Peas, with their wonderful capacity for improvement, are the general favorites, but there are many charming members of this family among annuals, herbaceous perennials, shrubs, vines and trees that are rarely seen in cultivation. One of these is the Yellow-wood, *Cladrastis lutea*. We are now enjoying the rapid and vigorous growth of a very small specimen of this beautiful tree planted six weeks ago, which greets us with new twigs and leaflets at every inspection. The *Cladrastis* is a native of Kentucky and the south, and has a compact head with a tendency to develop more on one side than the other, even when planted in the open and exposed on all sides to the sun. It has a very smooth bark and beautiful light green foliage, which turns to a warm yellow in the fall. It begins to bloom when small, and has hanging panicles of flowers, often a foot in length, cream-white and pleasantly fragrant.

Tulip-trees (*Liriodendron Tulipifera*) are now in bloom. They grow to enormous size. Our largest specimen girths nineteen feet four feet from the ground, and is as tall as our tallest Oaks. It is perfectly straight, and forms, with its four brothers, which are almost as large, a fine approach to the house, following, as they do, the line of the winding road. Just now they are busy marts for myriads of bees. Their profusion of green and orange Tulip-shaped blossoms, and their habit of standing out as they do in relief against the bright blue sky, make them worth coming miles to see. These are our largest trees, though we have one Oak which is nineteen feet in circumference, and many more of great size and unknown age.

Our most satisfactory Rose is a climber with Tea blood, and yet of vigorous growth and very profuse bloom. This is Madame Alfred Carrière. It has long outgrown the trellis, seven feet in height, which we thought ample when the Rose was planted five or six years ago. This Rose is large, well formed, double, delightfully fragrant, and is a beautiful cream color with rosy heart. It is hardy, and never receives the slightest protection and very little care, yet we find it hard to restrain it within due bounds. It is our favorite, though we

have many other Roses. Queen's Scarlet, Hermosa, Monsieur E. Y. Teas are now in bloom, and the old-fashioned Giant of Battles has a few flowers of glowing crimson.

Weigelas, Rhododendrons and Pæonies of the *Officinalis* type are our most showy May flowers. One great double Pæony is the color of the Giant of Battles Rose, and is magnificent at this time. I think it is *Pæonia officinalis rubra*.

Spiræa Cantoniensis, often called *S. Reevesiana*, is still very pretty, and so are the earliest *Deutzias* (*D. gracilis*). But it is for the Feast of Roses that the garden waits.

Rose Brake, West Va.

Danske Dandridge.

The Raisin Industry in California.

FROM a carefully prepared article by T. Goodman in the *Overland Monthly* for May, we make the following extracts:

The picking of raisin grapes requires more care, and is a slower operation than the gathering of other varieties. The clusters, cut from the vine carefully, one by one, all imperfections and bad berries trimmed off, are then arranged regularly on the trays, so that all will have a fair exposure to the sun. If heaped, or overlying each other in the least, the drying of the under bunches will be greatly retarded.

To make good raisins the grapes should undergo a kind of fermentation in the first stage of curing, which gives them a puffed appearance, and fills the air with a pleasant fragrance. From ninety to one hundred degrees in the shade is the temperature most favorable for this process. After the fermentation has ceased, and the grapes have taken on the shriveled appearance characteristic of raisins, the sun can do them no harm, however hot.

To facilitate the drying, and render it uniform, the trays are reversed after three or four days, in order that the trays to the northward may be exposed to the south. When the upper side has become well cured, which may be anywhere from a week to two weeks, the raisins are turned. The reverse side does not require as strong exposure as the other.

The total time of curing varies greatly—from ten days, or less, in hot weather, to a month or more under unfavorable conditions. Raisins cured in about fifteen days are the best.

When the bulk of the raisins is properly cured the work of taking them up is begun. For this purpose the trays are collected and piled in stacks of fifty or more, and sweat-boxes, each holding about one hundred pounds when filled, placed alongside them. Three grades are usually made—extra fine bunches for Dehesa, or Imperial Clusters; ordinary bunches for London Layers; and imperfect bunches and loose berries to be run through the stemmer. Bunches not sufficiently dried are laid on the trays and exposed to the sun again.

Those put in the sweat-boxes are never uniformly dried, some being overcured, and some not cured quite enough. To equalize them and soften the stems, which are very brittle when taken from the trays, they are placed in a cool room and allowed to remain for a certain period, during which the stems become flexible, and the undercured raisins impart their excess of moisture to the overdried ones, the operation resulting in a perfect uniformity throughout the whole mass, and a moist softness and elasticity to be gained by no other means. The raisins, at this stage, undergo some completing and crowning process, not fully understood, accompanied by the emission of a fragrance of indescribable richness. This equalizing—or sweating as it is commonly called—is one of the most essential operations in raisin-making, and it should last ten days at the very least. Haste to get the crop to market has led to a neglect of this necessary process, much to be regretted. Raisins are purposely overdried, taken directly from the field, steamed and packed immediately. A continuance of this practice will do incalculable harm to the raisin industry.

A few extensive growers pack their own crops, but the bulk of the packing is now done by establishments organized especially for the purpose. These ordinarily buy the raisins in the sweat-boxes, but in some instances they purchase the crop upon the vines, picking and curing it themselves. The packing-houses are mostly located in the towns. Some of them employ more than five hundred hands. Women and girls come to the town from all directions during the packing season, parties of them renting houses or living, gypsy-like, in tents. Earnings range from \$1.25 to \$3.00 a day.

The raisins are then pressed and slid into the packing-boxes. They are made in three sizes, quarter, half and whole boxes, holding respectively five, ten and twenty pounds. The last is always understood when speaking of a box of raisins, the others one-half and quarter boxes. The top layer is sur-

rounded with ornamental paper in addition to the plain white. The packer's label is placed over this, the printed cover nailed on, the edges nicely trimmed, and the box is ready for market.

Less care is required with loose raisins; and it is here that the greatest improvement has been made on the Spanish method of packing. A combined stemmer and grader has been perfected by which large quantities are handled with very little labor. The raisins are fed from a hopper into the space between a woven wire cylinder revolving within a larger cylinder of the same material, where they are broken from their stems; they then fall into a fanning-mill, by which the stems and dirt are blown away, after which they pass through a series of screens that grade them into as many different sizes as are desired. The better grades of loose raisins are packed in boxes with paper and labels, giving them an appearance nearly as attractive as that of layers; the inferior qualities are generally shipped in sacks.

The cost of labor prevents California from competing with Spain in some of the niceties of the raisin business. It would not pay us to trim and nurse the grapes upon the vines, in order to secure perfect bunches and large berries, nor to handle the clusters by the stems only. But with the exception of such fancy work, comparison with our great rival will be all in favor of California. Our grapes are more meaty and have a richer flavor, and our raisins are better cured, and will keep twice as long without deteriorating.

New or Little-known Plants.

Boltonia latisquama.

OF the small genus *Boltonia*, consisting of only three species, all confined to the territory of the United States, the most desirable as a garden-plant is *Boltonia latisquama*, of which a figure made from one of Mr. Faxon's drawings is published on page 271 of this issue.

Boltonia principally differs from *Aster* in the character of the appendix to the fruit or pappus, and, from the horticultural point of view, the plants of this genus are like tall loose-flowered perennial *Asters*.

Boltonia latisquama is a stout plant with thick striately angled stems, which attain a height of three or four feet, entire sessile leaves, which near the ground are large and broad and gradually decrease in size on the upper part of the stems, and broad, flat showy heads of flowers an inch and a half across with violet-blue ray-flowers.

It was discovered about thirty years ago, near the mouth of the Kansas River, by the late Dr. C. C. Parry, who sent it to the Botanic Garden at Cambridge, from whence it was distributed. In cultivation this handsome plant is very hardy and in good soil grows rapidly, soon forming broad clumps which in early autumn are covered with flowers. It is one of the best garden-plants of its class, and one of the most beautiful, hardy, tall-growing and late-flowering perennial plants in cultivation.

New Orchids.

RODRIGUEZIA LINDENI, Cogn.—Described as a new species, but in reality only a form of the ancient *R. pubescens* of Lindley, an elegant and very free-flowering little species.—*Journal des Orchidées*, iii., pp. 10, 12, fig. 1.

CIRRHOPE TALUM AMESIANUM, Rolfe.—A pretty little species, native of Dutch India, introduced by Messrs. Linden, of Brussels, with whom it has recently flowered. It produces umbels of six to ten flowers, the united lateral sepals being light rosy purple with yellowish white margins and apex, the rest of the flower being yellow except the brownish red lip, and the ciliæ of the sepals and petals.—*Lindenia*, t. 314.

STAUROPSIS WAROCQUEANA, Rolfe.—A very distinct species, introduced from New Guinea by Messrs. Linden, of Brussels, and flowered in the collection of Monsieur G. Warocqué, of Mariemont. It has a branching panicle, on which the numerous flowers are closely packed, their color light buff-yellow, with numerous light red-brown spots, and the lip white with some rosy spots.—*Lindenia*, t. 319.

Kew.

R. A. Rolfe.

Foreign Correspondence.

The Experiment Garden at Wisley in England.

ENGLAND is enriched with several gardens of hardy flowers, and among them is the garden formed a few years ago by Mr. G. F. Wilson, F.R.S., at Wisley, in the charming county of Surrey. This delightful garden was designed for the growth of hardy plants in general and Lilies in particular. It is called Oakwood, to distinguish it from the cottage garden and grounds that surround Mr. Wilson's principal residence, Heatherbank, on Weybridge Heath. Many enthusiasts in hardy flowers travel to Wisley to see this garden in Primrose or Lily time. Wisley is approached by a drive of six miles from Weybridge Heath through characteristic scenery, now in its freshest and most charming spring dress. Oakwood was formed out of an Oak-copse; the natural character of the place has been preserved, and the result is a wild, picturesque spot, brilliant with flowers from the season of Primroses until the last Lily has opened its blossoms in late October. Sixteen acres of ground are covered with plants, each kind grown in large patches, so that the individual character and beauty are shown to advantage. In this comparatively small area there are no great scenic effects, but through the clearings in the trees appear brave masses of color; at this season stretches of ground are blue with the lustrous flowers of *Gentiana acaulis*, that grows here very freely.

A visit to Wisley may be made at any season of the year, save the dead of winter, in the certain hope that it will prove profitable. At the entrance to the garden one of the most conspicuous features is a hedge of the Japanese Rose (*Rosa rugosa*); the plants were raised from seed, and now form a splendid hedge with their spiny and leafy growth. The crimson fruits make a show during the summer and autumn, and from June until late in the year a scattered succession of the varied colored fragrant flowers is maintained. This hedge is one of the finest we have seen, and is useful as well as beautiful. Changes are always being effected at Wisley, and the garden is ever presenting some new feature. This will be a year for the Kämpfer's Iris (*Iris Kämpferi*), the beautiful species that the Japanese hold dear. Mr. Wilson has planted no less than 3,000 examples in a field practically outside the garden, and the finest forms will be selected from these, as they flower, for the adornment of the margin of the pond. *I. Kämpferi* grows exceedingly well here, and in July it makes a delightful picture, large clumps being planted around the sides of the water, where they make a forest of luxuriant growth and bloom. It loves moisture, and does not mind even contact with the water, although it is often thought that this is fatal to the plant. The great point is to select flowers of good colors, as pure white or deep purple, many of the mottled and blotched flowers producing a poor effect. The season for this Iris and the several species and varieties of *Lilium* is perhaps the most suitable time at which to see Oakwood, although those who care for Primroses and Auriculas would choose the spring months. The Lily finds here a splendid home, with the best cultural treatment given to the bulbs; the result is superb growth, even of those kinds generally considered most troublesome and uncertain. The garden is occupied in part by Rhododendrons and other shrubs, and it is from their leafy undergrowth that the tall stems of the Lilies rise in profusion. On every hand there are Lilies, about half an acre or more being devoted to *L. auratum* and its varieties. The shrubs protect the shoots from frosts in early spring, and the soil that suits the Rhododendron agrees also with the Lily. Of course, many of the kinds are comparatively common, but for the choicer types Mr. Wilson has a series of bays, the sides of hurdles or furze to protect the stems from winds. Here *L. Browni* forms a magnificent clump and *L. giganteum* attains giant dimensions, the stems rising to nine feet in height or even more,

and carrying a large mass of flowers rising from the base of rich green luxuriant leafage. *L. Japonicum odorum* promises to bear a profusion of flowers this year. *L. Krameri*, perhaps the most troublesome of all Lilies to deal with, under these conditions gives a wealth of flowers of a lovely rose shade differing in tone in individuals. Except for *L. giganteum*, no manure is given—a point of importance, as manure does harm to the general class of Lilies rather than promotes vigor of growth and flower.

Every turn reveals some treasure; the sides of a ditch were gay at the time of our visit with groups of *Primula capitata*, the double King-cup or *Caltha* (*C. palustris flore pleno*) kissing the water with its double golden-yellow flowers. Christmas Roses seed about in the moist soil, and form splendid clumps, while Primroses attain great perfection of form. There are few English gardens in which the common Primrose and its many varieties are more finely represented. The old double crimson, a very rare form, was flowering freely, and at the entrance to the garden the sides of the walk were gay with flowers of the most delightful colors and superb form. They are planted against cool gray stone for contrast, and this intensifies greatly the orange and yellow shades. The varieties here are very different from the Primroses one sees in ordinary gardens and too often at exhibitions. There are no dead, dull colors, mauve or washed-out pink shades, but the colors are deep and clear. This exemplifies the great improvement that may be effected by choosing only the best forms and colors for seed. The crimson, pink, rose and intermediate shades are of intense depth, and large masses make a glorious picture of color. They are planted by the ditch and under the shade of trees, where they obtain moisture and are screened from the direct rays of the sun. Possibly the blue Primrose attracts most attention, as being a flower of unusual color. Mr. Wilson has been several years in bringing to perfection the hardy blue Primrose, and has succeeded in raising flowers that please the artistic sense of color. This flower must not be placed in the same category with the artificial green Carnation that Londoners wear in their button-holes, for the reason, we suppose, that it is something out of the common, but which is essentially inartistic. It is an outrage upon beautiful Carnations to water the plants with dye to produce the horrid metallic lustre. The blue Primrose, although blue is never found in the varieties of *P. vulgaris*, and is foreign to the flower, is of great beauty, as remarkably free as the common wilding, and the clumps nestling against the cool gray stones are certainly beautiful. It is scarcely correct to call them blue; they are not the same intense blue as the *Gentianella*, but rather of a purplish violet tone, set off with a small central eye of deep yellow. Mr. Wilson has raised several varieties, of which Oakwood Blue is the best. It is a lustrous cobalt color, intensified by the small yellow eye, and from the first experiments until the advent of this form we have a gradation of shades, each new one displaying an improvement in color. We may, therefore, in time expect a flower that will be a deeper blue even than Oakwood Blue. But it will not be easy to eclipse this famous type in form; the flowers are full, broad and of excellent shape. The remarks that we have made respecting the Primrose apply to the self or alpine Auriculas. They are as perfect as the art of man can make them, the colors strong and deep, and the shape of the flowers as perfect as the ardent florist can desire. The deep maroon shades are delightful, but we get many tones from brilliant rose to almost black, set off with body colors which provide a rich or suitable contrast. It is only by rigid selection that such results are attained, weeding out the pale sickly colors, and retaining the best to raise seedlings from. In this way the strain, as we call it in England, becomes freed from the miserable weakly trussed varieties of poor washy colors that are utterly useless for giving beauty to the garden, although, unfortunately, occasionally seen at exhibitions under distinctive names.

The most brilliant hardy plant in late spring and sum-

mer is the *Gentianella*, or *Gentiana acaulis*, which is allowed to spread out into large masses. Mr. Wilson has several varieties of it, and, to use his own words, "the gorgeous blue of the type, especially when grown in full sunshine, might make it seem that any change in color would be a step in the wrong direction, but in this case, as the varieties are all of delicate colors, no comparison is provoked." These forms of this familiar plant were collected by his son, Mr. Scott Wilson, on the Swiss Alps, one having pale azure-blue flowers, another white, touched lightly with delicate blue, and in the third form they are tinted with pinkish purple color, which is of a deeper shade on the reverse of the throat. In such a garden as this a host of things find a place, and in one cool, shady, moist spot, near stones, the *Soldanellas*, as *S. alpina* and *S. minima*, were growing into a perfect mat, thriving in the moist vegetable soil with great vigor. These are usually provokingly troublesome to grow, and it is a pleasure to see them in rude health. *Anemone Robinsoniana*, among the trees, was delightful, its delicate color being in charming agreement with the natural wildness of the surroundings, and in a sheltered corner several varieties of *Primula Sieboldi* were presenting gay masses of bloom. *P. Japonica*, already bursting into bloom, forms a perfect carpet of growth by the side of the ditch, and there are few nobler plants than this for forming bold clumps of foliage, enriched in the summer with showy spikes of flowers. There are several varieties, but we prefer the deep crimson, as more showy and effective than the delicately tinted types. *Muscari* vied with the *Gentianella* for creating a wealth of blue color, and it is when massed that the full beauty of such things is revealed. In late May one of the prettiest flowers was the *Angels' Tears*, or *Narcissus triandrus*, sometimes called the *Cyclamen-flowered Daffodil*, by reason of the shape of the flowers, which are not unlike those of a *Cyclamen*. It is grown in large colonies, the creamy white flowers carried gracefully on slender stems, and thrives with vigor in a warm situation and light soil. Near a large break of this *Narcissus* we saw a mass of the picturesque *Rubus phœnicolasius* tumbling over a hedge, and in the summer the effect of the clusters of scarlet fruit peeping out from their mossy calyx is interesting. Over Mr. Wilson's house, that stands on rising ground, and commands a view of lovely Surrey woodland, *Reve d'Or Rose* has thoroughly established itself, as has the delightful *Button-hole* variety, *William Allen Richardson*. The re-introduced *Shortia galacifolia*, whose appearance may be described as that of an enlarged *Soldanella*, is growing well in damp vegetable soil by the ditch-side, and this charming plant is likely to be much grown in England; the flowers are pure white, and the foliage of many shades of green and crimson.

Although Wisley is not a great place for trees, save the beautiful Oaks and Silver Birches that are the glory of the natural woodland, Mr. Wilson has planted many charming things, as *Prunus Pissardi* and the finest varieties of *Pyrus*. The deep chocolate leafage of *P. Pissardi* assumes a warm, rich purple-crimson as the season lengthens, and last year it produced an excellent crop of fruit, which is, however, hardly distinguishable from the foliage; it is not unpleasant to the taste, but would never, we should think, be grown for its excellence. The past two or three winters in England have been severe, and many of the tender shrubs, as *Veronica Traversi*, have been badly cut, but those that have survived show great vigor. It is interesting to note how curiously the frost affects plants. In one place a large bush is utterly killed, and another of the same kind a few yards away, and growing under the same conditions, remains untouched.

At Heatherbank and in the cottage-garden Mr. Wilson's interest in hardy flowers is everywhere manifest. At the side of the drive to the house, and in front of large banks of *Rhododendrons*, thriving clumps of the best varieties of *Lilium auratum* and *L. tigrinum* give pleasure. The plants failed by reason of the root-ridden ground through the

Rhododendrons, until the plan was hit upon of sinking casks in the ground, with the bottoms knocked out, and filling them up with good loamy soil. This kept out the roots of the shrubs, and the Lilies seem to increase in vigor each year, although they have been in position several seasons. The effect of these brave clumps of showy Lilies is very fine, the dark leafage of the shrubs throwing into bold relief the handsome flowers. In a clearing made in a wood Lilies have also been planted freely, and in the partial shade and in the soil and moist conditions surrounding them are the picture of health.

These few hasty notes upon a delightful English garden of hardy flowers will doubtless be read with interest by readers of *GARDEN AND FOREST*, many of whom have possibly visited Wisley to note for themselves Mr. Wilson's experiments. It is called an experimental garden, but this is a harsh word for acres of hardy plants, each allowed to grow its own sweet way and tell its own tale of beauty in foliage, habit and flower.

England.

V. C.

Cultural Department.

Hardy Narcissus.—I.

THE season of these spring-flowering bulbs commenced here about the 20th of April with *N. bicolor præcox* (Hartland). There were blossoms of this variety open seven days before any other. These were quickly followed by *Ard-Righ*, *Countess of Annesley*, *Golden Spur*, *Henry Irving* and *General Gordon*. All of these varieties are *Ajax* or *Trumpet Daffodils*, and they are also all yellow. With us these kinds came into flower in the order named. I learned after the bulbs of *Ard-Righ* were planted that "garden-soil kills them." *Ard-Righ*, *Leda*, and the white varieties, *N. Moschatus*, *N. cernuus pulcher*, *N. pallidus præcox* and *William Goldring*, require conditions different from those under which the rest of the family thrive. They are hardy; the trouble appears to be with their digestion, and rich soil seems too strong a diet. *N. Moschatus* is fast dwindling away. Next fall all these varieties will be planted among grass. The flowers of *N. cernuus pulcher* are very chaste and beautiful, as are those of *William Goldring*, which is later flowering than the other varieties of the section known as the *Swan's-neck Daffodils*. *Leda* was a complete failure; from the few bulbs planted not one perfect flower was produced. Of the *Ajax* varieties *Countess of Annesley* is the best with us; it is almost as early as *Ard-Righ* and *Golden Spur*, and has a much more expanded trumpet. It does remarkably well in ordinary garden-soil, and it has also the merit of being cheap. The old *N. trumpet maximus* is perhaps the richest-colored *Daffodil* grown, and is good in every way. Though not an early-flowering kind, it comes in with *Empress* and the best of the *Bicolors*. *N. rugilobus* is free-flowering and does well. Bulbs planted two seasons have this year produced five to seven flowers to a bulb. This variety resembles *Emperor*, but is smaller; the outer edge of the trumpet is beautifully set at right angles as if hammered out.

The *Saragossa Daffodil* is an early-flowering variety, but is much too dwarf for border-culture, the first showers bespattering the flowers as they scarcely reach more than three inches above the soil. It would be a good variety for pot-culture, owing to its earliness, and planted in a rock-garden it could be brought more on a level with the eye. This variety is of Spanish origin, and flowers freely. *King Umberto* is distinct from all others in having a deep yellow stripe down the centre of a paler yellow perianth; the trumpet is large; it is a desirable variety, though of no use for cut flowers. *Golden Plover*, *General Gordon* and *Emperor* may be called second-early varieties, as they flowered about May 1st. It is curious to note how differently plants behave in this climate from that in which they were grown for sale. *N. bicolor præcox* came first, but in regular order, but *N. muticus*, which was expected to be the last, was a very close second, and was in full bloom with the earliest kinds.

It was intended to have a nice lot of very late-flowering *bicolors*, and one hundred bulbs were planted. Our compensation lies in the fact that no two of the flowers were alike; some of the perianths were twisted, some were not, and the length of the rich yellow trumpet varied a good deal. All were alike in being cylindrical and cut off abruptly at the end. In this variety the flowers developed somewhat before the foliage, but next season they may behave differently. It is a very interesting kind to grow both on account of the shape and varia-



Fig. 51.—*Boltonia latistama*.—See page 268.

bility. The *N. Johnstoni* varieties are high-priced, and will probably never become popular even if cheap. Mr. Johnston once sent us a small importation direct of what he called *N. Johnstoni*. There are now several varieties of this type, and the kinds vary in themselves almost as much as between one

another. Mr. Johnston stated that the bulbs should be protected from frost, but they are quite hardy, and do well in the open ground. It is scarcely necessary, in this connection, to say much regarding Emperor, the finest yellow Trumpet kind we have. Our spring season has been one of exceptional dry-

ness, there having been only one slight shower during six weeks. The flowers have consequently lacked substance, and in some cases the coloring was deficient, more especially in the Leeds and Barri sections, where the cups are stained with orange in the normal coloring.

South Lancaster, Mass.

O.

The Rock-garden.

BEAUTIFUL effects may be secured by the use of rough stones and stumps in floral plantations, and a large variety of plants which continue attractive during the greater part of the year may be well grown in a carefully contrived rock-garden. Nearly all the dwarf plants ordinarily used in decorative gardening are suitable for the rock-garden, and by a judicious use of the materials employed in its construction suitable positions may be provided for the many choice plants that will not flourish in the general garden, or anywhere, indeed, but in such places as closely resemble the dry, almost barren characters of their native habitats. No form of horticultural art is more attractive and interesting, and the plants are generally inexpensive, though some rare kinds are difficult to duplicate.

The various species and varieties of the extensive genus *Narcissus* make desirable groups, as do the Snowdrops, Squills, Tulips and other early spring-flowering plants. The same may be said of the *Fritillarias*, of which there are many varieties. The spring Snowflake (*Leucoium vernum*) is now out of bloom, but its summer relative, *L. æstivum*, flowers freely in late May.

The red and yellow flowers of *Aquilegia Canadensis*, the Canadian Columbine, are very attractive, and the plant is one that takes kindly to any position short of the bare rock. It attains a height of about two feet in good soil, but its growth is much stunted where the earth is poor and scanty. It is a graceful plant, and flowers freely in any case, spreading rapidly by means of the seeds, which are annually ripened in large quantities.

Trillium grandiflorum lingers on, though the flowers are not so numerous as they were earlier in the season, and those that remain have become somewhat tinged with red. This Wood Lily is one of the most effective early-flowering plants for moist and shady situations, as at the foot of the rockery. Similar sites should be accorded the lesser Periwinkle (*Vinca minor*) and *Orobus vernus*. Both of these plants are in fine condition in May, and the *Vinca* rambles about over the rocks without the least regard to regularity. Its pretty blue flowers and deep green foliage are also serviceable in forming an exquisite mantle in places where the gloom is so dense that most other plants will not live. There is nothing better than *V. minor* for a shade plant, and where it fails experiments with other plants are generally futile. It is equally satisfactory in an open position.

Orobus vernus is a highly meritorious plant, and one that well deserves more attention than is usually given to it. It has been known to horticulturists for over two centuries, and although of easy culture, it has never been very common. A shady and rather dry position suits it best, and the soil should be loamy and of medium quality. It is about twelve inches in height, and of erect, compact growth. The numerous stems are furnished with light green, pinnate leaves, and the purplish pea-shaped flowers are borne profusely in racemes at the top throughout the spring months. It is a native of southern Europe, and easily propagated from seeds in spring, or by division of the roots in autumn.

The *Aubrietias* are very gay in dry, elevated crevices. They are all dwarf and of compact habit. The purple flowers of *A. deltoidea* are very pretty, as are those of *A. grandiflora*, which are lilac color and of larger size. *A. Græca* has an exceptionally trim appearance, and the flowers are of a rich reddish purple color and good size. The flowers of *A. Hendersoni* are of deep, rich purple color; those of *A. violacea* are somewhat paler. But the gem of the group is undoubtedly *A. Leichtlini*. It is extremely floriferous, and the blooms are large and of a bright rose hue. These plants are perfectly hardy, and require little attention when once thoroughly established. But with the exception of *A. violacea*, which seeds freely and is therefore easily increased, they are all difficult to propagate. The best method I know of is to divide the tufts very carefully after the flowering season, and plant the pieces in a frame, using light, rich soil. Shading will be found beneficial in very bright weather until growth is started, and water should be given when necessary. The new plants will be ready for their permanent places early in autumn, and will flower during the ensuing spring.

The evergreen Candytuft (*Iberis sempervirens*) is a mass of snowy bloom in May. It is a plant of somewhat shrubby character, about a foot high, and of thick, spreading growth.

At other times the dark green leaves have a peculiarly refreshing appearance, but now they are almost totally hidden by the sheet of flower-heads. It is quite a hardy plant and likes free exposure to sunshine. Cuttings of the young wood taken in summer afford the best means of propagation. These should be placed in sandy soil, and kept in the shade until rooted.

Scilla campanulata is in bloom now. The leaves are strap-shaped, decumbent and about a foot in length. The Hyacinth-like scape is erect, from twelve to fifteen inches high, bearing numerous drooping, bell-shaped flowers of pale blue color at the top. It requires good, sandy soil, and large masses give a charming effect in partial shade.

The Iceland Poppy (*Papaver nudicaule*) is extremely handsome in its various varieties, the flowers of which are either orange, white or yellow. The plant is dwarf, and forms dense tufts of pale green, finely cut leaves. The cup-shaped flowers are from two to three inches in diameter, and they are borne singly at the top of erect slender stems, which are from nine to eighteen inches high, and bare from base to extremity. This plant is a native of the northern parts of Europe, and stands through our severest winters wholly uninjured, provided it is given a sunny aspect, where water will speedily pass away from the roots. The plantations of this delightful Poppy should be renewed at least every third year, as the young plants are more certain to give satisfaction than those advanced in age. Seeds ripen freely, and from these an abundant stock of plants may be readily obtained by sowing early in spring. The plants thus raised will flower in late summer and the following autumn, and in both spring and autumn during succeeding years. The small brick-red or white flowers of the dwarf *P. alpinum* are interesting, but not nearly so beautiful as those of *P. nudicaule*, and they are insignificant beside those of the scarlet *P. orientale*, which will bloom a week hence.

Omphalodes verna, the creeping Forget-me-not, is another pleasing little shade-loving plant. It is a native of southern Europe, and was introduced into English gardens in 1633. The creeping stem is furnished with ovate leaves on petioles two or three inches long, and the intense blue, spreading flowers, with white starry eye, are about twice the size of an ordinary Forget-me-not, and are borne above in short racemes. Propagation is quickly effected by division, and the plant spreads rapidly where the soil is good and the situation favorable to its development. The pale blue flowers of *Myosotis sylvatica*, one of the true Forget-me-nots, are quite showy in masses at this season, and its white variety is also useful in the way of diversity. Although a perennial, it is best when treated as an annual. The seeds should be sown in autumn, keeping the plants under cover during the winter, and transferring them to the open in early spring.

The commoner plants in bloom include *Arabis alba*, *Armeria maritima*, *Corydalis nobilis* and *Dicentra spectabilis*. These are universal favorites, and need no description.

Cambridge, Mass.

M. Barker.

Garden Notes.

I AM now certain of a matter of great importance to small-fruit growers, namely, that the development of berries in the fall exhausts the canes for the next year's regular crop. 1891 was peculiar in showing all over our Raspberry-fields an effort to produce a second crop of fruit. I could pick a quart at any time in October, and had freezing weather held off two weeks longer there would have been several crates of red raspberries ripe at one time. These fruit-stalks should have been promptly pruned off. This could have been done in a few hours with hedge-shears or with fruit-clippers. Our Raspberry-canecan have this spring budded very slowly, and the ends of the stalks are devitalized. This was not due to cold weather, as the winter did no damage to more tender plants. The Cuthbert, with me, endures extreme weather.

The same result followed a large development of Strawberry-blossoms in the fall of 1888. I do not believe we can do better than to remove such flower-stalks with great promptitude. The fall-bearing Blackcaps are worthless for summer fruitage. I have carefully looked over my fields and in every case a hill that had a fall crop is worn out or dead. A fall-bearing berry is useless for market purposes, as there is no call for berries out of their season.

We had occasion to pull up a small Locust (*Robinia Pseud-acacia*) which had started in my greenhouse, and found on the roots a series of small tubercles. The next day we came on the same tuberculous growth on the roots of a clover, which was pulled from a Strawberry-bed. I had read the biological discovery that plants of the Leguminosæ family were able to extract nitrogen from the air, but had not so far associated the fact with these nodules. It is a matter of ex-

ceeding interest to farmers, and one easily verified, that all plants in this family are affected by a parasitic growth such as I have described. The disease is caused by a bacterium which assails the roots of the plant and then grows out into these very pretty nodules. Whereas many bacteria are injurious, if not fatal to life, this one adds a new and extraordinary power to the plant attacked, and it is enabled by some means not yet understood, but through this parasitic agency, to extract nitrogen from the air. With this explanation it is easy to understand why Clover increases land fertility instead of exhausting it, and why plowing under a crop of Clover-roots is of so much value to the land. Every root is a nitrogen extractor. Beans have the same power, and all other members of the family leguminosæ. It is very probable that this same power is added to the natural functions of some other plants, and the field of examination is extremely interesting. Our boys and girls should be taught biology, and especially in the departments of bacteriology and entomology.

Clinton, N. Y.

E. P. Powell.

The Garden in May.

TOWARD the end of this usually fickle month, the ordinary suburban garden blossoms out with tender plants which until this time have been carefully housed or have been bought en masse of the florist. These plants, observation will show, have a look of pained surprise at being moved to unaccustomed quarters, and it will be early summer before they are in harmony with their surroundings. No garden is complete without some of the invaluable tender plants, yet it seems incredible that any one should depend entirely on them, as is so frequently the case. A good garden is one which has the best obtainable plants at all possible seasons, and the merits of the plants are quite distinct from their being tender or hardy. If a certain class of plants can only be had in the open in summer, it would seem folly to allow the garden to remain a barren waste during the other three seasons. To lovers of nature, among which gardeners are usually classed, often, it must be feared, incorrectly, the tender foliage of the spring-time is one of the greatest charms of the early year. A garden of hardy plants at that time is a continually changing study in form and coloring, even if the many beautiful flowers of the season are not considered. That they are not more generally grown is perhaps due to this class of plants being less freely offered by the trade, rather than to a want of appreciation of them. The average plant-buyer is dependent on catalogues for his garden lore, and the plantsman has a tradition that "there is no money in them."

Not to speak of bulbs and the various plants which have been mentioned in GARDEN AND FOREST as the season has advanced, there are countless plants which are available as permanent occupants of the border, to appear with their various attractions as the seasons advance. With tender plants made a secondary feature, and hardy plants and bulbs the main reliance, one has a garden which will give generally a minimum of care, with usually less expense, and, if well considered, it will prove much more interesting and attractive. To form such a garden requires judicious buying, and it is well at first to confine purchases to a few well-known families of plants, ordinarily such as are cultivated largely by hardy plantsmen, and can be had at a low price. For example, as I write, the most prominent plants in the garden are the Columbines and the hybrid or German Irises. Columbine-plants may be bought, but a collection of German seed, such as is sold by the florists, will, if planted now, give flowering plants next year in wonderful variety. Mostly beautiful flowers these are, and there are also some which it will be no hardship to lose. There is a great difference in effectiveness among the different varieties. If the grower finds that the kinds bought give him pleasure, there are many other species to be selected and grown. If not satisfactory, the tentative experiment has cost little, and has at least been paid for by the pleasure of anticipation. The rhizomes of German Irises may be bought of most plantsmen in great variety at a very reasonable price, and they rank among the handsomest of garden-flowers.

Irises are called "the poor man's Orchids." There are few Orchids with flowers as handsome as some of the best of the Irises, and they have, besides, a nobility and grace all their own. They increase rapidly by creeping rhizomes, and soon give great masses of flowers. There are an endless number of species of this family, with widely divergent flowers and habits, and if subjects difficult of cultivation are desired, Irises can furnish a fair number to test the ingenuity of the most patient gardener.

Oriental Poppies are just commencing to show color above their graceful Acanthus-like leaves. It is unnecessary to say to any one familiar with Oriental Poppies that they alone furnish a garden in their season, everything else paling before their vivid fires. To others it may be recommended as a desirable plant to be carefully placed. But a vision of Larkspurs, Campanulas, Foxgloves, Spiræas, Phloxes, Pæonies, Coreopsis, Grasses, etc., remind one of the wealth of hardy things to come before the Roses are fairly represented, though the Japanese Rose has already opened the season with its chastely beautiful flowers.

Elizabeth, N. J.

J. N. Gerard.

The Bachelor's Button.—Various plants are known under this common title of Bachelor's Button. The name is a very old one, having been in use over three hundred years ago, with particular reference to a double-flowered form of *Ranunculus acris*, the Golden Bachelor's Button. It is mentioned by Gerard in his famous Herbal, and that author attributes its origin to the resemblance which the flowers bear to the jagged clothes buttons formerly worn in Britain. Other writers, however, according to Dr. Prior, declare that a habit of country fellows to carry these flowers in their pockets to divine their success with their sweethearts, gave rise to it. The other plants to which the name is given may be distinguished as the White, the Red, or the Violet Bachelor's Button; the plants are botanically *Ranunculus aconitifolius flore pleno*, *Lychnis sylvestris* and *Scabiosa succisa*. The last two plants are scarcely known in gardens, nor are they desirable except as curiosities, since there are many other more beautiful species of the same genera now in cultivation. *Ranunculus acris*, the Buttercup, is already a common weed in many parts of the United States, having been naturalized from Europe. Its double form is a much-esteemed garden-plant, flowering in May and June, and like the species in everything but the flowers, which are extremely useful for cutting. It is easily grown, and looks well in either the border or the rockery. Propagation is effected by dividing the roots. The White Bachelor's Button is a plant of similar utility and requirements, and usually blooms about a month later.

Cambridge, Mass.

M. Barker.

Correspondence.

The Winter-killing of Conifers.

To the Editor of GARDEN AND FOREST:

Sir,—I have observed some correspondence in your journal as to the winter-killing of certain coniferous trees, and I am constrained to say that in the Arboretum few of the *Retinosporas* of any variety have escaped burning more or less. The *Arbor-vitæ* have suffered greatly, and I have been compelled to cut away more than half of the growth of many quite large specimens. Even the Red Cedar has suffered considerably, and I never saw young White Pines in a worse condition, even plants of considerable size being badly scalded. A great many of the Balsam Firs, which ought to be hardy enough here, are nearly dead. Up to the 1st of March these trees all looked well, and my opinion is that much of the damage was done by some very warm dry weather in April, with high drying winds, followed by several severe nights, when ice was formed an inch or more in thickness. *Genistas*, *Cytisus* and *Furze*, wherever they were covered, are in a pitiable condition, while others which were left to themselves have come through safely. *Daphne Genkwa*, which has always survived the winters here with a light covering of earth, has succumbed this season. The *Ligustrums*, with the exception of *L. Ibot* and *L. media*, a dwarf form from Japan, have been hurt considerably, while *Weigelas*, which usually winter-kill badly with us, are in prime condition, and show hardly a dead branch. The varieties of *Berberis vulgaris* have suffered, while *B. Thunbergii*, *B. Sieboldii*, *B. Amurensis* and others from Japan and China are in fine form. The *Cotoneasters*, which are usually a little tender, show no harm. It is difficult to find any theory which will account for vagaries like these.

Arnold Arboretum.

Jackson Dawson.

To the Editor of GARDEN AND FOREST:

Sir,—The article from Mr. H. H. Hunnewell in a recent number of GARDEN AND FOREST, relating to the loss of conifers, has been read with much interest in this vicinity, where the loss of fine evergreen trees and shrubs during the past season has been quite considerable. Mr. Hunnewell's broad experience and intelligent observation give his statements special value and interest.

At my own grounds some excellent specimens of *Retinopora squarrosa* and *R. filifera* were materially injured, and from observation in other places, the past season has been one of the worst in several years, for many kinds of conifers. The loss of good specimens of *Retinoporas* within fifty and one hundred miles of New York has been considerable. Pines, Spruces, etc., have fared better, and but few losses are to be noticed even among the Hemlocks and *Arbor-vitæ*, which frequently suffer most in unfavorable seasons in this locality.

Considering the large exposed foliage of *Rhododendrons*, these plants have suffered comparatively little, although specimen plants at some of the fine estates on the Hudson and other places have lost a part of their foliage. It is of advantage to arrange all this class of plants in masses in beds or borders, where the conditions are favorable for retaining moisture in summer and winter.

Mr. Hunnewell is fortunate in having the large specimens of the varieties of *Retinopora* and *Thuopsis* he mentions. Many consider these varieties less hardy than the more common evergreens. Such results in the severe climate of Wellesley indicate that the right treatment has been given, and that the right plants are in the right place.

It is generally considered that the cold weather and unfavorable winds of winter and spring are the main causes of the loss of most evergreens. If this is a popular fallacy, and we come to a better understanding of the importance of a normal condition of moisture during summer and autumn, it will be comparatively easy in many cases to adopt remedies to avoid the loss of these beautiful trees.

New York.

Fred. W. Kelsey.

The Waukegan Nurseries.

To the Editor of GARDEN AND FOREST:

Sir,—June has come, and it finds the Apple-blossoms here about just opening and the pink leaves of the White Oak no bigger than squirrels' feet. Rain fell two days out of every three in May, and practically there has been continuous wet weather since February, so that looking from the car-window a visitor sees water flowing in the furrow after the belated plow in one field, and the farmer in the next one planting corn in the mud. I rode out to Waukegan to see Robert Douglas, and found the veteran nurseryman in his overcoat. To an inquiry whether this was a fair sample of early June weather in Illinois, he replied that no spring so cold and wet had been experienced in this vicinity since 1844, which was the year when he drove out here in a buggy from the eastern slope of the Green Mountains. In mid-June then all the country was under water about Chicago, and in the young town itself a few wagons were moving through the streets, while many more were fast in the mud. He managed to find a place to sleep on the floor of a hotel, the earlier comers having preempted the dining-room tables, but his horse stood out all night tied to a post without a mouthful to eat, for the farmers could hardly get into town without swimming, and any attempt to haul oats or hay was out of the question. The next day he reached drier land, and he kept on through different depths of mire until he reached Waukegan, where his horse gave out, and left him stranded. Practically his home has been there ever since, although he is known to almost every one between the two oceans who is interested in arboriculture, and of the trees from nursery seedlings now standing in forest-plantations in the United States a greater number have been raised by him than by any other man; in fact, until within a few years more forest-tree seedlings were raised by him than by all other nurserymen combined.

When the Waukegan Nurseries were founded, nearly half a century ago, Ellwanger & Barry had recently established the Mount Hope Nurseries; but west of Rochester the only establishments of sufficient size to warrant the issue of a catalogue were those of Hodges, of Buffalo; Custed, of Cleveland, and Elliott, of the same city. Mr. Douglas began at the outset to raise seedlings for Apple and Pear stock, and although he was warned that he never could compete with imported Pear stock, he was soon sending large quantities of excellent material to the older American nurseries in the east. In 1863 he had fifty acres of Apple-seedlings, which he sold at a year old for \$8.00 a thousand. Meanwhile he had begun the pioneer work of raising deciduous forest-trees from seed, and for a long time he had little competition. In later years, however, these trees have been produced in enormous quantities on the cheap land farther west, and comparatively few species are now produced on a large scale at Waukegan. He still grows many Soft Maples and Elms and Birches for ornamental planting, and great blocks of Black Cherries, Catalpas, Green Ash and White Ash, for forest-planting.

The raising of coniferous trees from seed, however, requires special skill, and the production of these trees continues to be the leading specialty at Waukegan. After many experiments and some costly failures Mr. Douglas learned that the methods pursued in the Old World could not be trusted in our dry and hot climate, but he finally succeeded in securing proper conditions of shade and moisture by various devices, and especially by covering high frames with the leafy boughs of forest-trees, and since then his success has been assured. Constant watchfulness is required, since young seedlings remain sometimes as long as three years in the seed-bed before they are transplanted to the nursery rows, but the vigor of the trees raised here has been tested all over the country, and the luxuriant growth of the young trees now standing in the nursery bears witness to the intelligent and thorough way in which they are brought forward. White Pines are raised here by the million. The Red Pine is produced in smaller quantities, not because it is more difficult to grow, but because the demand for it is so limited. Buyers seem slow to recognize the superior merit of this tree, both for forest and ornamental planting. It requires greater care in starting, but it is worth all the trouble it costs, and the time must soon come when it will be very largely used not only for its beauty in parks and private grounds, but for its usefulness in forests. Special attention is devoted here to raising the hardy evergreens from the Colorado Mountains, particularly the Douglas Spruce, the Colorado Blue Spruce (*Picea pungens*) and the beautiful Fir, *Abies concolor*. Mr. Douglas was among the earliest to secure seeds of these trees, and collecting them as he does in regions where the winters are severe and the summers are dry, the seedlings prove perfectly hardy. Nothing can be more beautiful than the long stretches of *Picea pungens* which are standing at an even height of four and a half or five feet in the nursery rows. These trees give perfect satisfaction wherever they are used, and even in parts of Minnesota where the Box Elder and the Green Ash fail, they endure the winters without harm. The Douglas Spruce is a still more beautiful tree which is just beginning to be appreciated, and long rows of specimens, from six to eight feet high, already show its remarkably graceful habit and soft foliage. The White Spruce is another tree which is very largely grown, and it is much more satisfactory under many conditions than the Norway Spruce. All the hardy conifers, native and foreign, are grown here in quantities, and the scale on which this business is conducted can be seen from the fact that as many as five million seedling trees have been sold in a single year.

At different times we have given accounts of the forest-plantations which have been made by the firm of Douglas & Sons under special contract. Under these contracts the firm agrees not only to furnish the trees but to prepare the ground for them, to plant them four feet apart each way, and to take entire charge of the plantation for a number of years and deliver the forests to the owners after each acre contains a guaranteed number of trees of a given size which completely shade the ground. When the trees have reached this size it is assumed that they can hold their own against the encroachments of prairie-grass and weeds. The advantages of this arrangement are that the work of planting, as well as the care of the trees while they are young and feeble and need the most intelligent attention, is confided to trained hands. Very few people in the country have planted a hundred acres of forest-trees in a single body, but under this arrangement Mr. Douglas has planted many larger tracts, one or two of which cover a square mile in area. The firm has planted 3,000,000 Catalpa-trees in a single county of Kansas.

Of course, so close an observer as Mr. Douglas would find varieties of trees which have special merit, and some of the specialties of the Waukegan Nurseries, like the *Arbor-vitæ* known as Douglas' Little Gem, the Waukegan Trailing Juniper, the Golden *Arbor-vitæ* and a silver-tipped form of the same tree, are well known to planters. Of special interest just now is a large block of what Mr. Douglas calls the Large Cone Balsam. The original trees came from the Wolf River, in Wisconsin. Some of them, which have attained a height of some thirty feet, are standing on the beautiful lawn in front of Mr. Douglas' old place, and they are certainly splendid specimens. The lower limbs have not died away, as is usually the case with the common Balsam, but they are furnished fully to the ground. The leaves are longer and the cones are much larger, and they are so different from the common Balsam that they can be readily detected at a distance even in the seed-beds. Altogether, the tree is distinct and beautiful, and promises to be of great value in ornamental planting.

But, after all the treasures of the Waukegan Nurseries have

been studied, the visitor will find their highest interest centering in the personality of their founder. Mr. Douglas carries his eighty years so lightly that he seems to have discovered the fountain of perpetual youth, and he looks as fit to set out for California now as he was in 1849, when he started for the Pacific coast with an ox-team and, having lost them in a swollen river, tramped on foot to his journey's end. There are few parts of this country where the native trees have not been studied by his observing eyes, and his stores of practical knowledge in his specialty are almost inexhaustible. His memory retains impressions with remarkable tenacity, and his picturesque way of recounting the experiences of his long eventful life is a source of unending pleasure to all who meet him. Above all, his broad public spirit, his transparent honesty, his manliness and gentleness, command universal respect and affection.

Chicago.

S.

Recent Publications.

Les Fleurs à Paris: Culture et Commerce. Par Philippe L. de Vilmorin. Paris, J. B. Ballière et Fils. 1892.

This little book will, at the very first sight, interest all growers of plants by reason of its author's name; for Monsieur Philippe de Vilmorin is not only the son of Monsieur Henri L. de Vilmorin, the learned and famous French horticulturist, but represents the fifth generation of the Vilmorin family which, in one or more of its members, has devoted itself to the culture of plants, and more than any other single family has raised French horticulture to its present high position.

His father, in a brief introduction, explains the origin of his book. About a year ago, it seems, Monsieur Henri de Vilmorin was asked by the French Association for the Advancement of Science to speak about "Cut Flowers" at one of the conferences which this association holds each winter in Paris. Afterward the Messrs. Ballière, publishers of the *Bibliothèque Scientifique Contemporaine*, asked him to elaborate the substance of his lecture, so that it might form a volume in this collection of useful popular manuals. But as other demands upon his time were too numerous he turned the task, together with his own materials, over to his eldest son, whose work now lies before us. The father asks the reader's indulgence on the ground that this is a maiden essay, published before the writer had entered his twenty-first year. But one does not feel that his plea needs to be insisted upon, for the young man has his full share of the widespread French aptitude for graceful literary expression; and, of course, one can trust his facts as implicitly as though his father's name stood on the title-page instead of his own.

The book is intended as a guide for the amateur horticulturist, and, consequently, the greater portion of it consists of descriptions of plants adapted for ornamental use in the gardens and greenhouses of France. These are grouped as "Annuals," "Biennials," "Perennials," "Bulbous Plants," "Hot-house Plants" (with a special treatise on Orchids), "Trees and Shrubs," "Flowers of the South," "Flowers and Grasses to be dried for Winter Bouquets," and "Foliage and Ornamental Greens." Each division is full enough to satisfy the needs of the most enterprising amateur; the plants named in it are chosen with knowledge and taste; simple notes as regards their culture are appended, and excellent little illustrations explain their aspect. Many hints may be gathered by American horticulturists from these pages, although, of course, their indications are not always adapted to our very different climatic conditions, and he will miss certain plants which, favorites here, are less generally known in Europe.

But the most interesting part of Monsieur de Vilmorin's book for transatlantic readers is that which treats, in a general way, of the flowers of Paris—what they are at successive seasons of the year, where and how they are produced, and in what manners they are sold. It is in northern countries, as the author explains, that the trade in cut flowers and plants is regularly organized, and assumes the proportions of a national industry. In southern lands flowers grow everywhere at all seasons of the year, and, of course, are everywhere offered for sale. But the traffic in them has not been obliged to regulate itself as has such traffic in regions where frost and snow prevail during many months of the year. The greatest flower-markets, therefore, are those of Paris and London; but only in recent years has Covent Garden flower-market grown to an importance at all comparable to that of the chief Parisian market, while in Paris the trade has so largely developed of late as to necessitate the establishment of a number of smaller markets. In America, on the other hand, says the author, although flowers are used in winter as profusely as anywhere

in the world, "people have hardly the time to frequent flower-markets. They want the commodity brought to their doors. So the large towns are abundantly supplied with flower-shops, which often extend themselves largely over the sidewalks."

Monsieur de Vilmorin's description of the great market at the Halles Centrales is so interesting, and will doubtless be so new to the majority of our readers, that we reserve it for somewhat full translation at another time. Meanwhile, however, we can note his enumeration of the chief flowers sold in Parisian markets and streets at the different seasons of the year.

"In the fine days of spring," he says, "before Paris begins to empty itself, the markets are in their full splendor, . . . and purchasers are simply embarrassed to choose between flowering bulbs, early Roses, Deutzias—the favorite ornament of the month of May—the first Pinks, Chinese Primroses, Cinerarias, which have not yet gone out of bloom, innumerable Gilly-flowers, Forget-me-nots, Indian Azaleas, which are at the height of their season, Gardenias, and a hundred other varied plants. At the same time armfuls of Lilacs, Mignonette and Narcissus attract attention by their perfume, and great baskets of growing Pansies, double Daisies, Anemones and Ranunculi offer themselves for the decoration of little city gardens and window-boxes. In the middle of summer China Asters rule, with Pinks of every shade, Gladioli, now so prodigiously varied in color, Agapanthus, Gauras like white butterflies, Amaryllis of every form, Chinese Perillas with dark brown foliage, Lillies (*Lilium speciosum*) in their red and white varieties, golden Lilies of Japan with their powerful odor, Tuberoses as strongly scented, Plumbago Capensis of tender blue, Madagascar Periwinkles, and the Gypsophyla and Stevia, which give lightness to bouquets. Then, piled in baskets, are Mimulas, Verbenas, Balsams, Ageratums, Lobelias, Nemophilas and all the charming annual flowers of the open ground. The autumn is now wholly given over to Chrysanthemums. . . . Nevertheless, after them may still be seen Asters, Laurustinus, Christmas Roses, and soon Persian Cyclamen's, which begin the series of winter-blooming hot-house plants. Toward Christmas the winter-foliage decorations begin to appear—Mahonias bronzed by the cold, Hollies with their pretty red berries, the spiny Butcher's Broom, tufts of Mistletoe bearing their viscous fruits, and, coming from the south, sprays of the Japanese Spindle-tree and the American Pepper-box (*Schinus molle*) with its clusters of pink berries."

We know of no book of just this character which has been prepared in this country. But we think that one similarly moderate in size and price and popular in form, which should describe the traffic in flowers and plants that goes on in New York, the places where they are grown and the manner of their cultivation, and should give sensible lists of such plants as are best suited for amateur cultivation, might find a wide public of interested readers. At present, American amateurs have to depend upon the information contained in horticultural journals, where, of course, they may not always be able to put their finger upon such items as are most wanted at the moment; and upon trade catalogues, in which, very naturally, everything is named, everything is equally recommended, and a very undesirable degree of stress is laid upon novelties. The materials from which the American amateur may choose are even richer than those that lie ready to the hand of the European amateur; and his need of such guidance as is supplied by a book like Monsieur de Vilmorin's is greater than the European amateur's need in exactly the same proportion. To choose his materials is the first and most important step which he has to take; and, at present, it is perhaps the most difficult of all steps to take with wisdom.

Notes.

Mrs. Katherine Brandegee recently printed in *Zoe* a "Catalogue of the Flowering Plants and Ferns growing spontaneously in the city of San Francisco," which names 485 species, citing their localities. Notes of an instructive sort are added, and also a list of local Mosses, collected chiefly by Mr. H. W. Bolander.

Owing to the lateness of the season, the annual Rhododendron show of the Massachusetts Horticultural Society has been postponed until Friday and Saturday, June 10th and 11th. A special prize for fifty trusses of not less than fifty varieties, offered by Mr. Francis Brown Hayes, will be competed for at this time. On Saturday, August 6th, a silver vase valued at twenty-five dollars will be awarded for the best display of Sweet Peas. This is one of the prospective prizes of the society, and must be taken by the same person or firm twice in three consecutive years. This is the third year that the society has offered this prize.

Although as a flowering tree *Maackia Amurensis* is very inferior to its relative, the North American Yellow-wood, *Cladrastis lutea*, it is very beautiful when the young foliage is expanding, and is worth planting for the effect it produces in early spring when the young leaves have a peculiar gray-green or mouse-color, and are very unlike those of any other hardy tree or shrub. *Maackia* is now well established in many northern gardens, where it flowers profusely late in June, the minute pea-shaped yellow-green flowers being produced in slender upright spikes which make a pleasing contrast with the rich dark green foliage. The seed-pods are small and do not compare in beauty with those of the Yellow-wood.

Judged by the specimen now flowering in the Arnold Arboretum there is no shrub more beautiful at this time than *Rosa grandiflora*, with its great single white flowers as handsome as those of the Cherokee Rose and far more fragrant. This fine plant, in spite of the fact that it is an old inhabitant of gardens, is rarely seen in these days, although the growing taste for single-flowered Roses must soon bring it into general cultivation. In 1825 it was figured in the *Botanical Register* (t. 888) by Lindley, who thought it might have come from Siberia, although he was uncertain of its origin. It is of the same section as the Scotch Rose (*Rosa spinosissima*), but far excels all the varieties of that handsome plant in the size and beauty of its flowers and in the boldness of its dark green foliage.

It would be delightful, says "The Listener," in a recent number of the *Boston Transcript*, "if we could have an opportunity to see a garden laid out and kept up exactly in the Japanese manner. It would be an attractive idea to have a Japanese garden in one corner of Franklin Park. There is a sufficient number of Japanese trees and flowers which are hardy in this latitude to make it possible to furnish a garden entirely with Japanese vegetation; and the gardeners of Japan are famous for making beautiful gardens in a very little space, so that not much room would be needed. We could not have avenues of Plum or Cherry trees five miles long all at once, but we could unquestionably get some very instructive suggestions, and it would be very interesting to everybody."

Decades of North American Lichens, prepared by Clara E. Cummings, associate professor of botany at Wellesley College, and Mr. A. B. Seymour, of the Cryptogamic Herbarium of Harvard University, can be obtained by addressing Miss Cummings at Wellesley, Massachusetts. The first thirty or forty species of the series will be ready for delivery in June. These early decades will contain many of the commonest species, well suited to beginners in the study of Lichens, teachers and classes in high schools, academies and colleges. The specimens will be enclosed in envelopes or glued to small sheets ready for mounting in the herbarium, and will be accompanied by printed labels, all critical species being verified by comparison with the Tuckerman Herbarium. The price, seventy-five cents for each decade, is unusually low.

A paragraph in the *Bulletin of the Torrey Botanical Club* for May, calling attention to an article by Monsieur A. Franchet, recently published in the *Journal de Botanique*, says: "It is interesting to note the discovery in the Chinese province, Yun-nan, at an altitude of 3,200 metres, of a *Kelloggia* that closely resembles *K. galioides*, Torrey. The habitat of the latter is in the coniferous forests of the Sierra Nevada and the mountains of Arizona, Utah, Washington and Wyoming, and the finding of a second species demonstrates the extension into Asia of a genus hitherto considered solely American. *Kelloggia Chinensis* is another and interesting example of the simultaneous existence in North America and central Asia of certain very characteristic plant types. Remarkable among many such cases is that of Ram's-head Lady Slipper, the presence of which in the mountains of western China was most unexpected."

In this year's "Grand Corso and Battle of Flowers," at Florence, one of the carriages which attracted the most attention was covered—body, wheels, steps, driver's box, whip and harness—with Lilies-of-the-valley, while the ladies who sat in it were dressed in white and carried parasols of the same flowers. Another carriage, dressed also with Lilies-of-the-valley, showed on each side the family coat-of-arms wrought with red blossoms. Another was adorned with Forget-me-nots and yellow Roses, another with white Roses and pink Azaleas, another with Lilacs and white Roses, another with Forget-me-nots and very small pink Rosebuds, another with Daisies, white Lilies and Maiden Hair ferns, another all with yellow Jonquils, and still another, described as especially graceful in effect, with great masses of Wistaria. Large umbrellas formed

of flowers covered, like canopies, some of the smaller equipages, and in all cases the occupants were costumed in harmony with the decorations of their carriages.

Speaking of the extensive experiments of the Canadian Government in tree-cultivation, the *Popular Science Monthly* says: "At the Central Farm, near Ottawa, the seeds of Rocky Mountain and European conifers have been liberally sown; and in 1891 one hundred and seventy-five thousand seedlings were transplanted from the beds to be distributed later on to branch farms and private experimenters, who are to send in careful reports of progress. The Government also distributed one hundred thousand forest-tree seedlings among one thousand applicants in the northwest, with instructions for planting and subsequent treatment. Twenty-five gardens along the main line of the Canadian Pacific Railway have been supplied from the experimental farms. Speaking of the need of the application of forestry in the old provinces, Mr. J. C. Chapais mentions whole regions as known to him which were cleared by settlers who had to desert the land soon afterward because it was worth nothing. Such districts, he adds, would have been so many inexhaustible wood-reserves for future generations, but are to-day useless."

About the middle of May Secretary Lyon, of the Business Men's Moderation Society of this city, began his annual work of distributing flowers to the children of the city poor. He took his station in Paradise Park, that oddly misnamed little pleasure-ground which lies in the vicinity of Mulberry Bend and the Five Points, at three o'clock, just when the schools were dismissing their pupils. The flowers, which had been brought that morning from New Jersey, included Violets, Wistarias, Honeysuckles, Lilacs and Dogwood-blossoms, and were tied in bunches of convenient size. As they were given into the eager little hands, the scene was a noisy as well as a smiling one, and the windows of adjoining tenements were crowded with grown persons, who shared the children's delight. This special charity is not fathered by the society of which Mr. Lyon is the Secretary, but is personally his own; and most, if not all, of the flowers which he thus distributes from time to time come from his grounds at Short Hills, and are gathered and arranged by his children. More good is done in ways like this than in many of the ways with which charity has been longer familiar; and the good is to the donors, of course, as well as to the recipients. Very few New York business men can be expected to take the time and trouble needed for the actual following of Mr. Lyon's example; but there are many who, with very little trouble indeed, could regularly send quantities of flowers for distribution to him, to some hospital, or to one of the many charitable societies which would be thankful to receive and distribute them.

A developing fruit appears to be comparable with a chemical laboratory on a small scale. Here we have inorganic matter converted into organic matter, and the latter changed by the life-processes into other varieties of organic matter, in a way which we can only marvel at. Last summer ripening cherries were made the subject of a special study by W. Keim, who has recently published the details of his research in the *Zeitschrift für Analytische Chemie* (vide xxx., pp. 401-407). He specially examined the changes which take place in the chemical composition during the growth and maturity of *Prunus cerasus*. The variety studied was the early Griotte, specimens of which were gathered from a single tree, at intervals of seven to ten days, and analyzed, and the *Gardeners' Chronicle* gives a summary of the conclusions reached. As the fruit ripens the percentage of water decreases, the dry substance increases, so does the acid, and, of course, too, the total amount of sugar. In the earlier stage of maturity, citric acid (the acid of lemons), malic acid (the acid of apples) and succinic acid are present, but nine days before perfect maturity is reached the latter quite disappears. Invert sugar is present from the start, and in the last stage is ten per cent. of the entire weight. Dextrose and levulose (two sugars) are present, with inosite, another sweet substance at first, but toward the end the inosite occurs merely as a trace. The progressive increase in the percentage of acid during the whole period is not in harmony with the old view that the sugar is formed at the expense of the acid. The disappearance of succinic acid as ripening is approached suggests the theory that the other acids are formed synthetically. Cane-sugar is present only in the leaves, in proportions which increase as the ripening is approached, but subsequently diminishes. No starch was detected at any stage in the growth of the fruit, though the parenchyma-cells of the peduncle showed starch-granules, increasing in amount as the fruit ripened.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLES:—American Poplars. (With figure).....	277
The General Design of the Columbian Fair Grounds.....	278
Questions for American Botanists.....	278
The Flower-trade of Paris.....	279
The Time of Roses.....Mrs. Danske Dandridge.	279
NEW OR LITTLE-KNOWN PLANTS:—A New Water-lily.....	280
FOREIGN CORRESPONDENCE:—A Visit to Mount Salvatore in May, 1892..H. Christ.	280
CULTURAL DEPARTMENT:—Notes on Shrubs.....J. G. Jack.	282
Hardy Narcissi.—II.....O.	283
Natural Varieties of Narcissus Tazetta.....W. E. Eudicott.	283
The Water-garden.....J. N. G.	283
Notes from the Harvard Botanic Garden.....M. Barker.	284
The Pear Psylla.....E. G. L.	285
CORRESPONDENCE:—The Color and Form of Houses.....S. P. S.	285
A May Outing.....F. J. Le Moyne.	286
American Species of Ash.....Alfred Wesmæel.	286
Hardy Plants at Passaic, New Jersey.....J.	286
RECENT PUBLICATIONS.....	287
NOTES.....	287
ILLUSTRATION:—A Group of Populus trichocarpa in the Yosemite Valley, Fig. 52..	281

American Poplars.

THE genus *Populus* is not a large one, although the species are widely scattered, and no other trees, perhaps, play a more important part in the economy of nature. Poplars are not easy to understand, although, like the Willows, to which they are closely related, the structure of the flowers is very simple. The two sexes, however, are separated on different plants, and individuals show a perplexing tendency to vary in habit and in the form of the leaves, while natural hybridization increases the difficulties of the student, who finds among them, too, uncertain varieties of unknown origin long known in cultivation.

Poplars grow in the boreal parts, on the mountain-ranges, and by the banks of midcontinental streams in both northern hemispheres, and often attain a large size in places where no other tree can exist. They are able to support intense cold and great atmospheric dryness if their roots can reach water; their light seeds are produced in immense quantities, and, furnished with an appendage of buoyant hairs, are blown far and wide in spring and early summer, and reaching the ground, while it is still moist, germinate quickly, while broken branches carried by wind or water often root when they reach the ground. Poplars, therefore, are unusually well equipped with means for multiplication, and are able to spread over large areas where less favored trees cannot obtain a foothold.

In North America eight species at least may be distinguished; the most valuable of them, although the smallest, is the so-called Quaking Aspen (*Populus tremuloides*), a tree very similar to the Old World Aspen (*Populus tremula*). The value of this little short-lived tree, which rarely attains the height of fifty feet, is not in the wood it produces, for this is small and of no value except in paper-

making, but lies in the power of its seed to germinate in burnt soil and in the rapidity with which the young seedlings grow and cover exposed surfaces of bare ground. By holding the soil on mountain-slopes and affording shelter for the seedlings of longer-lived and more valuable trees the Aspen has played a conspicuous part in the perpetuation of forests, and no other plant, perhaps, from the time it appeared in direct descent from a familiar type of the tertiary Arctic flora to the present day has had so great an influence in the composition and distribution of the subalpine and boreal forests of North America. In its present form the American Aspen ranges from Newfoundland to Labrador and Alaska, and southward through the northern states, and over mountain-ranges of the interior of the continent, where it ascends almost to the upper limits of tree-growth, marking steep and barren slopes with broad light-green splashes, which in autumn glow like gold against the dark background of rocks and stunted Pines.

A tree of larger size and of circumpolar distribution, for it is common in Europe and Asia as well as in America, is *Populus balsamifera*, commonly called in this country Balsam and Balm of Gilead, because the buds are covered with a resinous balsamic exudation which is sometimes used medicinally by rural practitioners. In America this fine tree ranges from the shores of the Straits of Belle Isle to Alaska, and southward to within the northern borders of the United States. It is very common in British America, where on low sandy river-plains and islands it constitutes forests of considerable extent and plays an important part in controlling and directing the drainage of a vast territory. In cultivation the Balsam is a handsome tree, especially the variety *Candicans*, of uncertain origin, which is distinguished by its large leaves, pale or nearly white on the lower surface; it is very hardy, it grows with surprising rapidity, and in cold countries no tree will attain to a large size in so short a time. Like other Poplars, however, the branches are brittle and easily broken, and the trunk is often injured by boring insects which prey upon all the trees of this genus, especially when they are isolated in cultivation or planted in too warm a climate or in too dry soil.

Closely related to the northern Balsam is a tree of western America, where it ranges from British Columbia to southern California. This is the *Populus trichocarpa* of recent authors, who find in its pubescent ovaries and fruit sufficient reason of its specific distinctness. The western Balsam is one of the tallest of the genus, and individuals approaching two hundred feet in height, with tall, slender stems, are not rare at the north, where it forms handsome open groves by river-banks at low elevations, while at the south it seeks a cool and humid atmosphere by climbing into mountain cañons, which it decorates between four thousand and six thousand feet above the sea-level. In the picture on page 281 of this issue, taken from a photograph made by Dr. William H. Rollins, appears a well-known grove of the western Balsam on the banks of the Merced River in the Yosemite Valley, from which our readers can gain a good idea of the general appearance and manner of growth of this tree in central and northern California, where it does not attain such a large size as it often does in Oregon and Washington.

The familiar Cottonwoods which line the banks of the great rivers and of the scanty and uncertain streams of the central and south-western parts of the country are Poplars, whose bright green foliage and grateful shade have cheered the hearts and excited the imaginations of thousands of worn and discouraged travelers on the plains and deserts of western America. To three trees, the name of Cottonwood due to the white silky hairs attached to the seeds, has been indiscriminately given. The first of these is the Carolina Poplar (*Populus monilifera*), an inhabitant of river-banks in all the country from eastern New England and northern Florida to the eastern base of the Rocky Mountains; it is the common Cottonwood of the streams

which flow eastward from the Rocky Mountains, and under favorable conditions grows to the height of one hundred and fifty feet, and sometimes forms trunks eight or nine feet in diameter. It is a beautiful tree with a tall straight massive trunk, a spreading head and large lustrous leaves, and of all Poplars is perhaps the most desirable as an ornamental plant. The wood, like that of all the species, is light and soft, but close-grained; it is, however, very difficult to season, and is apt to warp badly in drying. Of late years it has been somewhat used in the Mississippi valley, where the Carolina Poplar is abundant, for cheap packing-cases and other coarse work, and it is now probable that this tree is to play an important part in supplying the country with certain low grades of lumber.

The second species of Cottonwood is confined to the banks of the streams of the Rocky Mountain region, where it is found from the Black Hills of Dakota to Colorado, New Mexico, Nevada and Arizona. It is a small tree, usually under sixty feet in height, and is distinguished by its narrow entire leaves to which it owes its name, *Populus angustifolia*.

West of the Sierras of California, from the valley of the Sacramento southward, the third species, *Populus Fremontii*, is found—a large tree not to be distinguished from the eastern *Populus monilifera* except by the structure of its flowers and fruit, and, to untrained eyes, apparently identical with it in habit, foliage and beauty. In the southern part of California this tree is replaced by a well-marked variety, still too imperfectly known, which is common on the borders of all streams in that part of the state and in Arizona, southern New Mexico, western Texas and northern Mexico, where it is the ordinary shade-tree of city streets (see GARDEN AND FOREST, vol. i., p. 104). Economically this last is a tree of great value as it furnishes the fuel of the people living in the territory adjacent to our southwestern boundary, where it is planted near streams and irrigating ditches, and every few years the large branches are lopped off and supply all the fuel needed for cooking.

In the forests of eastern America two other Poplars are found, *Populus grandidentata*, so called from the cutting of the leaves, a handsome small tree of the north, and *Populus heterophylla*, the River Poplar, a tree of no great size, which inhabits deep, wet swamps in the eastern and southern states, and the rarest of all our species, although it can be found in two or three localities in the neighborhood of this city, notably at Northport, on Long Island, and on Staten Island, where a few years ago Professor Britton made known its existence in considerable numbers.

The General Design of the Columbian Fair Grounds.

THE committees of the Chicago Commission, upon whom has devolved the responsibility of selecting the site and constructing the buildings for the Columbian World's Fair, have proved that they appreciate the true function of the landscape-gardener in works of that character where gardening in its accepted sense plays a very subordinate part. They did not make choice of a site, select places for the various buildings, and then invite the advice of artists in landscape to devise some scheme of planting for decorative effect. The first experts consulted were Messrs. Olmsted & Co. It was realized at the outset that the entire work was to be treated as a unit; that there was to be a general design which should solve, in the most satisfactory way, all the problems which might confront the organizers of so vast an undertaking, so that the amplest facilities should be offered to exhibitors and visitors, and that these should be combined with the noblest artistic effect.

It is no discredit to the architects who are doing such splendid work in Chicago to say that in one sense their individual efforts are subordinate to the general scheme—that is, each building is really a detail of the design which includes them all. Of course, it was necessary for the Messrs. Olmsted to consult with Mr. Burnham, Chief of Con-

struction, and Mr. Root, the Consulting Architect, as well as with the designers of the separate buildings, but, after all, it was the primary and peculiar office of the landscape-architects to discover all the possibilities of the site and prepare the foundation and frame-work of the general arrangement; to estimate to some extent the proper size of each building, and to place it in the best position, both for convenience and beauty; to study the grouping of them all not only with regard to their practical relations to each other, but also with regard to the impressiveness of their appearance in combination. In this case, as in many others where the counsel of men who stand in the foremost rank of their profession is secured, apparent difficulty was transformed into opportunity. The necessity of elevating the swampy ground into terraced levels above the water-line to make foundations for the massive structures left excavations, which were turned into canals and waterways. These not only increase the facilities for conveying visitors from one part of the ground to another by making it possible to land them at any one of the buildings, but they heighten in a marked degree the beauty of the scene. Verdurous shore-lines and bright stretches of water are thus made possible, and the prevailing stony effect of the buildings is relieved from many points of view by masses of foliage on the island which has been raised above the lagoon, while the buildings themselves are never as imposing as they are when seen from the boats which float below the line of their bases.

All this emphasizes the fact that the landscape-gardener is not, as he is too often considered, a sort of mere outdoor decorator and furnisher. His work is serious, practical and serviceable in the highest sense. Even in public parks and pleasure-grounds, where architecture plays a less important part than it does in the case we are considering, it is too often forgotten that a good design involves the settlement of numberless questions of every-day practical availability apart from the development of its landscape beauty. Of course, it is not meant by this that landscape beauty is sacrificed to what is commonly considered utility, for in such a case the beauty itself gives to the park its highest usefulness. The problem is to preserve and create beauty where it is possible, and at the same time to provide for great numbers of people in movement and at rest, to secure their distribution so as to prevent overcrowding at special points, to supply the conveniences and comforts and amusements demanded by different ages, sexes, conditions and tastes. Architects who design dwelling-houses for private places are learning that they can be materially aided by expert counsel in determining for such buildings the proper site, approaches, aspect, outlook and other points in which they are related to their surroundings. Such counsel is quite as useful to the health and convenience of their clients as it is to the beauty of the home picture. This means that true landscape-art, like the best architecture, is the "decoration of a service." Its real value is based on the fact that it adorns what is useful.

The Chicago Commission deserves the thanks of the country, not only because it has secured for the great exhibition the services of eminent architects, who are working together in perfect sympathy, but because this harmonious labor was made possible by trusting to experts to furnish a general design toward which they could all work with unity of purpose. Besides this, an example so striking as this ought to exert a wholesome influence in helping to establish landscape-gardening in this country in its proper position among the arts of design.

THE Botanical Club of Washington, District of Columbia, at a recent meeting, unanimously adopted the following report of the Committee on a Botanical Congress and Nomenclature:

"Resolved, That, while favoring the final settlement of disputed questions by means of an international congress,

we do not regard the present an opportune time, but that we recommend the reference of the question of plant-nomenclature first to a representative body of American botanists.

"We suggest the consideration, by such a body, of the following questions among others: The law of priority; An initial date for genera; An initial date for species; The principle, 'once a synonym always a synonym'; What constitutes publication; The form of ordinal and tribal names; The method of citing authorities; Capitalization? We recognize the Botanical Club of the A. A. A. S. as a representative body of American botanists, and commend to that body for discussion and disposal the subject of nomenclature as set forth in these resolutions."

These subjects are important to every botanist. It is to be hoped that the projected movement will be responded to and that it will receive the support of all persons interested, so that these questions shall no longer vex American botanists.

The Flower-trade of Paris.*

FLOWERS and always flowers, in the dog-days as during the hard frosts of winter—this is what the Parisian public demands. As long as a low temperature does not interfere with the growth and expansion of flowers in our latitude, the horticulturists of the environs of Paris almost altogether supply its markets. But as soon as cold weather arrives, the artificial heat of the greenhouse must replace solar heat; and if this alone were available, horticultural products would be very costly. Happily, therefore, now that rapid transportation has developed so marvelously, a part of the necessary floral provision of Paris comes from the south of France—from the shores of the Mediterranean.

Whether they come from the immediate neighborhood or from the most distant provinces the flowers all converge, in arriving at the capital, toward a central point, whence they pursue their journey in various directions according to their purchasers. This centre of the trade is at the Halles Centrales, or main market of Paris.

Every night, at Paris, shelters with its darkness a spectacle well worthy of being displayed by day. Strangers seldom witness it; but this greatest flower-market in the world must be seen if one would understand the importance of the trade in flowers and the number of persons whom it occupies. At present it is inadequately accommodated; but it is proposed to build in the Halles a special structure for the flower-trade, or else to create for it a wholly independent market-place.

The flower-market is now held, in a tremendous draught, beneath the shelter of a covered street which crosses the great market. In this cold passage-way, open to all the winds of winter, flowers begin to arrive as soon as night falls. First, heavy railroad trucks bring the consignments of the south in very light boxes and baskets of willow or of split and braided reeds. Then come the growers of the vicinity of Paris, bringing their wares in two-wheeled covered carts, and having started at different hours, according to the distance they had to traverse. All try to arrive as early as possible in order to secure a good station, or else send representatives to secure one, arriving themselves at a later hour, shortly before the opening of the sale.

Discharged from the trucks and wagons, the merchandise is spread upon the sidewalks and a portion of the asphalt road. Each seller pays, per diem, four or five cents for each metre of space, according as it is sheltered or exposed. Some thirty of them, however, pay for their stations by the month. Paths are left between the masses of flowers of different exhibitors for the free circulation of purchasers.

As the temperature falls during the long dark winter nights, the waiting is tedious and the wind is very chill. Protected by thick coverings and guarded with solicitude against anything that might diminish their commercial value, the flowers themselves are less to be pitied than their unfortunate proprietors. But when the weather is very inclement the sale is transferred to the vast cellars under the Halles, and the aspect of the flower-market is then very picturesque. Temporary and shifting stations are established, tables are made with wooden horses, and on these tables are displayed the flowers which, in these days of heavy frosts, are of few varieties—Violets, yellow Narcissus, with Roses and Mimosas from Cannes.

The sale commences at three o'clock in the morning in summer, and at four in winter. Then the animation and activity of the market are remarkable. At this hour there are few amateurs. All transactions pass between tradespeople, who, as a rule, know one another, and are rapidly accomplished. Most of the purchasers are middlemen, who later sell again in the city what they have bought in the early morning. And we also see traders who, without leaving the market, embark in quick and apparently remunerative speculations. At the beginning of the sale, while the flowers are abundant, they buy them for low prices, and then, hiring a seller's station, they wait till values have gone up, and, displaying their wares with taste, dispose of them at a profit. Dealers of this sort are called hucksters.

Every one is not free to cry his wares in the market. Only two individuals have this right, and for it they make a deposit of 10,000 francs. Moreover, the entire market is under police surveillance, and everything proceeds in an orderly way.

The *Commissionnaires de Fleurs* (flower agents) and the *forts* (porters, or, literally, "strong men") still remain to be mentioned. The *Commissionnaires* are forty in number, and perform a double function. In the first place, they facilitate the use of the market for producers living at a distance. Every Provençal horticulturist cannot afford to keep in Paris a representative to receive his consignments, carry them to the market and superintend their sale. So he arranges with a *Commissionnaire*, who takes charge of the reception and sale of the flowers, reserving, of course, a percentage of the receipts for himself; and meanwhile, from this centre of the trade, he keeps his client informed of all its fluctuations, so that he may direct his efforts to the best advantage. In the second place, the *Commissionnaire* performs a very useful work of selection. From the enormous quantities of flowers which he receives, before they are taken to the market he separates the rare and much-sought-after ones, and sells them to the chief florists and to rich amateurs. The whole cost of the production and transportation of a consignment may thus sometimes be paid for by a few choice articles, which are called the "Very Fine South" (*le très beau midi*), so that the remainder, which is called "Ordinary South" (*le midi ordinaire*), when taken to the market can be sold so cheaply that afterward, from the barrows of the peripatetic peddler, we can buy them more cheaply in the streets of Paris than at Nice or Cannes. On an average these *Commissionnaires* receive, altogether, some thousand or twelve hundred baskets of flowers, which come chiefly, especially in winter, from the south; the number of the local florists who come in person to the market varies during the different seasons, being greatest in summer, but on an average they deposit about 800 baskets of flowers at their stations, and so some 2,000 basketfuls are sold daily at the Halles.

The *forts* of the Halles are famous, and form an ancient corporation, the honesty of which is proverbial. They unload each wagon as it arrives, and give its proprietor his station-ticket, so he can go in peace to put his wagon in an indicated spot on one of the neighboring streets, while his merchandise is being carried to his station by the *forts*, who are responsible for its safety. And for ten cents a night his wagon and horses are cared for by another band of employees specially charged with this duty.

At nine o'clock the sales are finished. The peddlers' wagons, with their loads complete, scatter through the streets; the florists send their purchases home in hand-carts; and the growers take the road again, sleeping the sleep of the just under the great green hoods of their wagons, while their horses follow their own wills, encumber the middle of the high-road, and sadly impede circulation.

The Time of Roses.

THE path which rises at the back porch and runs, in an easterly direction, between banks of Peas, Beans and Strawberries throughout the length of the vegetable-garden until it is finally lost in a sea of wavy Wheat, is bordered on both sides throughout its course by a number of old-fashioned shrubs and other plants. Among these is a Rose which wanders at will over the grassy banks and is just now in perfection of bloom, glorifying the vegetables and even lending a touch of poetry and grace to our Tomatoes and Cauliflowers. This is a Damask Rose planted fifty years ago by the dear old lady who, with her white-haired husband, once lived at Rose Brake, and was as enthusiastic over the flowers of her day as are we over our newer loves. To this old lady we are indebted for the blue and white Irises which cluster at the foot of the large old Cherry-tree, a sapling in her time, for the exquisite double

* Translated from Monsieur Philippe de Vilmorin's *Les Fleurs à Paris*.

white Narcissus, as handsome as a Gardenia, and the many Daffodils and early Jonquils which have formed numerous thriving colonies in the grass; for the Cinnamon, Hundred-leaved and other old-fashioned Roses; the stately Yuccas and many other charming plants. Among these the old Damask Rose, with exquisitely sweet, semi-double, large, flat flowers of a rich bright carmine, is a prime favorite. One variety is striped with white, and is the York and Lancaster Rose, now seldom seen except in old gardens or pressed between the leaves of venerable volumes of poetry by hands that have long been still.

In the Rose-garden, at one side of the house, very many aspirants for the prize of beauty have now entered the lists, and it would puzzle the most critical connoisseur to decide where to bestow his warmest praise. Madame Alfred Carrière has reached the stately height of sixteen feet, and is bending under a weight of flowers; there are hundreds of these large double roses scenting the warm June morning. No doubt, the mother cat-bird, whose secret is deftly hidden in the midst of a perfumed cluster, thinks that all this display of grace and beauty is in honor of her downy nestlings, in whose praise the father bird sings all the day. Turning from this pretty picture the eyes are greeted on all sides by a profusion of Roses, old and new, scrambling over rocks and palings, climbing up the little arbor, which they share with many Honeysuckles, or confining their fresh luxuriance to more orderly beds and borders, where they mingle many tints and varying odors into a perfect harmony of joy.

There is the fairy bed of tiny Polyanthas, which are always to be depended on for an abundance of rosette-like blossoms; the white Paquerette, smallest of Roses, just the size of a five-cent piece; the charming pink Georges Pernet; the beautiful salmon-colored Perle d'Or, a miniature likeness of Safrano, and the blush and cream of Mademoiselle Cecile Brunner, larger than the rest. All these are faintly sweet except Paquerette, which has a strong and unpleasant odor—strange in a Rose, and stranger still in a Fairy. Another drawback in Paquerette is an ambition leading it to begin much more than it can accomplish. Never were seen so many little buds, most of which turn yellow in infancy and come to an untimely end. Only two of the best colors are missing from this little bed. We have as yet no bright or dark red Polyantha, and none of a lemon-yellow. These may exist, and would be a pleasant addition.

On the south side of the house grow some climbing Polyantha Roses. One of these, planted two years ago, has reached the windows of the second story, but has not bloomed. Another, Max Singer, is showing a number of blossoms, and is very double and slightly fragrant. It is a light pink in color, not a very pretty shade, but the plant is vigorous and hardy. Very few yellow Roses do well with us out-of-doors. Harrison's Yellow is pretty at this time, but the finer Teas are too delicate to be of much use in our garden, where plants which can take care of themselves best, and live and flourish with the least coaxing and coddling, are the favorites.

Sunset, Perle des Jardins, Madame Welche, and very many other golden beauties, have all been tried with varying want of success. Beautiful Madame Joseph Schwartz lived and bloomed for several years, and then died of rapid consumption just as we had reason to hope that its health was established. Perle des Jardins is a great bush, but the heavy buds do not open well; indeed, they do not open at all, but blight and turn brown upon the tree. Isabella Sprunt consoles us for many failures. The bush is five feet in height and about the same in circumference, and gives us dozens of perfect, not very double, lemon-yellow Roses, best in the half-opened state. Safrano is also very satisfactory, never failing us, and so are Laurette, which is cream-colored, and is not a Tea, but probably a Noisette, and Madame Hippolyte Jamain, a very lovely Tea of delicate habit and flowers which are outwardly white, with a fine salmon heart. These Roses have stood the test of many winters, and seem to improve with age.

The old-fashioned Hundred-leaved Rose, and some hybrids of Provence whose names I do not know, are the best for pot-pourri, for rose-water and for filling dainty sofa-cushions. These are now beginning their annual struggle with the slug, which has not appeared in as great numbers as usual, the cold spring having apparently checked their increase.

Among the rarities now flowering in the shrubberies is a variety of *R. rugosa*, which is labeled *R. rugosa*, var. *Himalaya*. This is a large bush, with smaller, lighter, less glossy foliage than that of the common variety. The flowers are double, but in other respects they do not differ greatly from the type.

Thompson's Magnolia is fading in the White Garden. This is a beautiful Magnolia; the flowers are at first large creamy

cups, falling flatly open before they fade. It is a hybrid of *M. glauca*, I believe, and blooms when only four feet in height.

Cornus paniculata and *Robinia viscosa* have been conspicuous in the shrubberies for the past week. The Pæonies are making a gorgeous display in their isolated bed, where the grass of the lawn forms a fine setting for them. Vicomtesse de Belleval and Modeste are the handsomest now in flower, with an almost pure white variety, very double and sweet-scented.

Rose Brake, West Va.

Danske Dandridge.

New or Little-known Plants.

A New Water-lily.

NYMPHÆA LAYDEKERI ROSEA is a new hybrid Lily introduced this year by Monsieur Marliac, who has previously added *N. chromatella* and numerous less well-known Nymphæas to our collections. This variety having only been sent out in the late spring, the plants have not had time to become thoroughly established and show their best form. But as they are now in flower quite as early as established plants, it may be well to note the variety as it now appears. The flowers are rosy pink of a deep tint, deepening toward the base of petals. They are single, and in form very much resemble those of *N. pygmæa alba*. The deep orange stamens also resemble that variety in their arrangement. The leaves are small, broadly sagittate, smooth, very slightly undulated, a vivid green above and of a reddish hue under. The flowers at present open are about twice the size of those of *N. pygmæa alba*, and open about ten o'clock A. M., closing in the late afternoon. It is evidently a thrifty, quick-growing variety, and, as it is said to flower continuously till October, it will prove a welcome addition to our collections, though probably not a variety of first rank in size of flower.

Foreign Correspondence.

A Visit to Mount Salvatore in May, 1892.

IF there is anywhere a mountain made to charm the heart of a lover of plants it is the proud pyramid of dolomite which rises to the south of Lugano, its base completely surrounded by the arms of that lake, the most beautiful sheet of water of the Italian slopes of the Alps, known as Ceresio, or the Lake of Lugano. This pyramid is Mount Salvatore, now accessible to all the world by means of a little cable-road boldly pushed up its steep flanks. It is not a high mountain, for its summit is less than four thousand feet above the level of the ocean, but the boldness of its outline and its steep slopes and vertical cliffs give it a truly imposing aspect, and its flora, especially its spring flora, contains a number of plants rarely seen outside of gardens, which are here luxuriating in their native wilds. The base of the mountain is wooded with venerable Chestnuts; over the slopes are spread thickets of many species of shrubs, while the summit is covered with a delightful sub-alpine vegetation. Here may be seen *Daphne Cneorum*, which looks like a diminutive alpine *Rhododendron*, the flowers delightfully fragrant, like those of all the family; *Erica carnea*, a lovely Heath with bright rich red flowers, and *Polygala Chamæbuxus* in its two varieties, the one with white flowers, a common plant in the Swiss Alps, and the other with red flowers, a variety only known on this mountain. The flowers with their bright purple wing-petals and golden keel are probably the most beautiful of the genus, their charm being heightened by the evergreen leaves and the compact habit of a real alpine plant. I cultivate this beautiful variety in my garden, and I can recommend it for rock-work.

Among other shrubs is *Cytisus Laburnum*, which, on every side, hangs out its long clusters of bright yellow flowers, a real shower of gold, *Ostrya carpinifolia* with its Hop-like blooms, *Cytisus hirsutus* with large sulphur-colored flowers, *Rhuscus aculeatus* with bright coral-red berries appearing on the middle of the branches dilated into leaves, and *Amelanchier* with its long pure white petals. But the most interesting plants of the mountains are those which grow under and among the bushes. The entire wood is filled with the dark green leaves of innumerable plants of *Helleborus niger*, the Christmas Rose, so dear to us all and the familiar ornament of our peasant-gar-

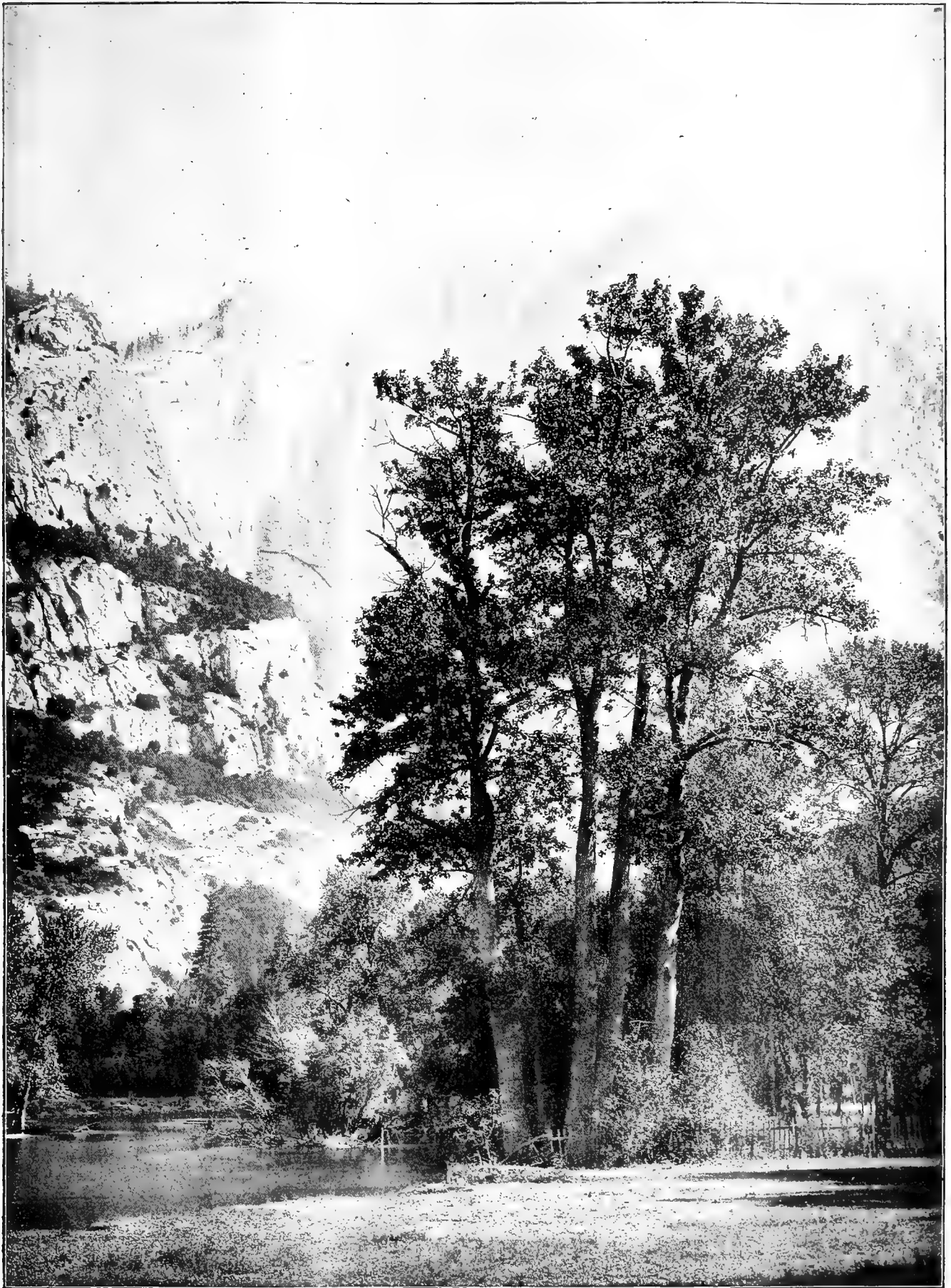


Fig. 52.—A Group of *Populus trichocarpa* in the Yosemite Valley.—See page 277.

dens, in which the white flowers tinged with rose generally appear at Christmas-time. The abundance of this beautiful plant in the woods of Salvatore is prodigious, and the effect produced by its flowers, which last from November until February, must be delightful. But this is not all, for with *Anemone Hepatica* appears *Cyclamen Europeanum*, which, by thousands, spreads its handsome circular leaves, dark green spotted with white on the upper and vinous red on the lower surface, and in summer enlivens the shades of the forest with its delicately fragrant red flowers. The rosettes of foliage of *Anemone Hepatica* vie in grace with the *Cyclamen*, and in one spot I noticed the white variety of *Vinca minor*, which is an exceedingly rare plant outside of gardens. On the margins of cultivated meadows and terraces appears *Narcissus radiflorus* with a white perianth, the cup bordered with red; the brilliant flowers give the fields the aspect of a garden. There are, besides, clusters of *Galanthus nivalis* and of *Primula acaulis*, with its dark yellow flowers, clumps of the robust *Helleborus viridis* with green flowers, and of the beautiful *Myosotis sylvatica* of tenderest blue, the bright purple flowers of *Orobis vernus*, var. *tenuifolius*, of *Symphytum tuberosum* with its yellow pendent bells, and here and there the noble *Struthiopteris Germanica*, with the curious *Dentaria bulbifera* with its living bulblets in the axil of each leaf and peduncle, as well as its congener, *D. pinnata*, with its great white flowers. These add interest and variety to the upper slopes, and in summer the flanks of Salvatore facing the east, shelter flowering masses of the most beautiful of the *Scabiosas* (*S. graminifolia*) with its silvery linear leaves, and the white-flowered *Helianthemum polifolium*.

The walls of dry stones, which abound in this country, deserve special attention, for, thanks to the humidity of the climate, they are covered with a thick carpet of verdure composed of rare and beautiful plants. The thick sod of *Asplenium trichomanes* forms the principal part of this covering, in which appears the delicate *Selaginella Helvetica*, whose last year's fronds are distinguished by their bright red color; *Ledum album*, var. *maximum* and var. *cetæa*, the Maiden Hair Fern, *Adiantum Capillus-Veneris* and *Asplenium Adiantum-nigrum* are mingled with *Ceterach officinarum*, covered with its dark brown scales. On the blocks of granite found among the limestone of Salvatore, *Asplenium septentrionale*, *Mœhringia trinervia* and *Cardamine impatiens* grow side by side with splendid clusters of *Cystopteris fragilis*. These plants form the principal vegetation of the walls which line the paths of the base of the mountain. Those walls, so beautifully decorated by nature, suggest the possibility of imitating her example and of clothing our own dry walls with the plants which affect naturally such situations, by transplanting them into the cracks between the stones. In doing this the gardener will be able to convert his bare and ugly walls into a charming flower-garden, where he will find that many rock-plants, which cannot be cultivated in any other way, can be made to flourish. It is only necessary to inspect the garden of the late Monsieur Boissier, the distinguished botanist at Valleyres, in Switzerland, to understand how many rare plants, which he found impossible to grow in any other way, can, when planted on walls, be made to thrive as luxuriantly as if they had been planted by nature.

I can only give a brief account of the floral treasures of Salvatore; it certainly does not contain a more beautiful plant than *Helleborus niger*, which possesses the marvelous faculty of developing its charming flowers in the middle of winter, surrounded by snow, in a very low temperature—a flower which is the touching emblem of the joy which the Christmas-time brings to us all.

Bâle, Switzerland.

H. Christ.

Cultural Department.

Notes on Shrubs.

SPIRÆA THUNBERGII is the first of the *Spiræas* to develop flowers in this latitude. The present season was a little more backward than the average, and the first blossoms became conspicuous in the latter days of April. The fruit of this pretty species is now well advanced toward maturity. It ripens here about the first week in June, and any one desirous of raising plants from seed should carefully observe when the little capsules begin to open and collect them before the seed escapes. The seed germinates very readily, with shade and moisture and the slightest covering of soil, and will start at once and make good little plants by the autumn of the same season in which it ripens. In two or three years such plants will be bearing flowers. Of course, a more expeditious way

of obtaining new plants of this species is by cuttings, and strong young plants may be very easily propagated by green cuttings, taken at this season or a little later, and started in a moist atmosphere, as under a bell-glass or glass frame. *S. Thunbergii* is one of the most useful of all shrubs for planting in shrubberies, because, besides its ornamental flowers, its delicate foliage is interesting and beautiful all summer long, and in the autumn its colors are hardly surpassed by those of any other shrub in cultivation, and the leaves have the merit of persisting for an unusually long time.

For a double-flowering *Spiræa* the old-fashioned plant called *S. prunifolia* is the only really hardy species as yet available for our northern gardens, and the foliage of this is also notable for its bright autumn coloring. The flowers this season have been less beautiful and satisfactory than usual, owing to wet weather and long-continued cold. We have not yet had a plant with single flowers which could certainly be called the wild type of this double-flowering favorite in gardens.

All persons interested in the double-flowering forms and who have space and patience for experiments should try the double form of *S. Cantoniensis*, which is, perhaps, more commonly known among nurserymen as *S. Reevesiana*. The flowers of this are the largest and most beautiful of any in cultivation, but in this latitude the fault of the plant is that it is not perfectly hardy. Some years it survives the winters better than others, but we always expect the tips, and often portion of the older wood, to be killed, even with a good deal of protection. The blossom of the single-flowered form is much handsomer than that of *S. trilobata*, of which the supposed form, or hybrid, known in the trade as *S. Van Houttei*, is the best of all the thoroughly hardy *Spiræas* for cultivation at the north. This *Spiræa* and *S. Cantoniensis* blossom at the same time, and are just now (June 3d) in their best and most beautiful condition. There are various species and forms of *Spiræa* which are intermediate in their time of flowering between the earliest blooming and these, but most of them are characterized by blossoms with a yellowish or greenish tinge instead of being pure white, and they are, therefore, not so attractive as the flowers of Van Houtte's *Spiræa*, which are large and quite white, and are set off by peculiarly clean-looking dark green foliage. In good soil the plant grows four or five or more feet high, becoming widespreading by the bending and arching over of its stems and branchlets, whose upper sides are covered by numerous umbel-like corymbs of flowers.

Any person able to afford space for but one *Spiræa*, and wishing that one for its blossoms, should select *S. Van Houttei*, if the climate is as severe as that of Boston. The blossoms of many of the white-flowering species of *Spiræa* possess a peculiar odor, not agreeable to most people. This odor is less noticeable in the flowers of *S. trilobata* and of *S. Van Houttei*, and is almost entirely absent in *S. Cantoniensis*, so that the value of its large handsome flowers is thus enhanced.

The flowers of shrubs are most abundant at this season. All of the early *Spiræas* have white flowers, and the closely allied Pearl-bush (*Exochorda grandiflora*) surpasses them all in the snowy whiteness of its bloom. It is sometimes complained that the flowers lack individual interest, are cold and without anything to excite sentiment or admiration except by the almost dazzling effect of the full bloom. But, although the blossoms are formal and almost bold in effect and lack agreeable fragrance, they appear after Apple-blossoms have faded and before *Deutzia* and *Philadelphus* flower, and certainly at this season we have nothing surpassing it in effectiveness. The flowers themselves are most interesting just as the buds are opening. The great fault of the plant is its open habit and thin uninteresting foliage. Except when in bloom it has no value, and it needs to be massed with other shrubs that its defects at other seasons of the year may be hidden. It is not considered an easy plant to propagate, and probably the amateur will procure new plants most readily by layering at this season. Few seeds are produced on young plants, but as they get old they often fruit quite abundantly, and as the seed grows quickly new stock may in this way be easily procured.

Close beside the Pearl-bush, in botanical order, is placed the old-fashioned *Corchorus* of our gardens, a name which should be supplanted by that of *Kerria Japonica*, as being more correct and quite as euphonious. The most common form seen is the double-flowering one, which some amateurs have been known to call a "Flowering Almond with yellow flowers." But the double-flowering form is not nearly so charming and beautiful as the single or aboriginal form, whose five bright golden petals and numerous long stamens in each blossom give it something of the appearance of a *St. John's-wort*. The flowers average nearly an inch and a half across, and as they are produced singly on slender stalks, and are set off by pretty

light green foliage, they have a peculiarly attractive effect when a plant is in full bloom. A situation where it can have partial shade is the best for this shrub, as the flowers become bleached sooner in intense sunlight.

The plant is not what we would call thoroughly hardy in all situations in this climate, as very frequently many of the branches or tips of the branches are destroyed during winter. But once well established it will generally thrive in a partially sheltered and well-drained situation. It may be propagated by cuttings, layers or by division of the roots, and pieces of roots will also put forth sprouts and make good plants. The stems of *Kerria* are of a light yellowish green color, with something of the effect produced by some Willows or Cornels, so that in winter they form a striking contrast among the stems of other plants in the shrubbery. There is a form of this with white variegated leaves, but it should not be selected except as a monstrosity or curiosity.

Arnold Arboretum.

J. G. Jack.

Hardy Narcissi.—II.

EVERY year these interesting spring bulbs are more widely grown, the dealers tell us, and frequent inquiries are made for the choice hybrid varieties included in the Leedsii, Barrii and Burbridgei sections. These varieties differ but little from each other, and if many of each section are grown labels are necessary for their identification to any but the most expert. Among the Burbridgei varieties Falstaff is the most striking. The perianth segments meet and form a perfect flower without any of the starry look, which is a feature in many varieties. Constance is another good kind, and John Bain, Guinever and Edith Bell are cheap and good. The principal feature of this section is their pure white perianth and general likeness to the Poet's *Narcissus*, although most of them flower earlier than that species. The centre of the flower is cup-shaped, often distinctly margined with orange or scarlet, although these markings are hardly as distinct as the catalogues would have us believe. The climate, soil and season may, however, be responsible for variations.

The Leedsii, or Eucharis-flowered kinds, contain many beautiful varieties; these are high-priced, and are, therefore, not generally cultivated, but one of them, *Duchesse de Brabant*, should be grown in any collection, however small. It is a free and early flowering kind, coming in with the varieties of *N. incomparabilis*. It is always noticeable for its chaste elegance and for the number of flowers of somewhat starry outline. While the Leedsii kinds are said to have white perianths, it is not the white of a *Poeticus*, but is of a creamy shade. *Duchesse de Brabant* would be a good variety for pot-culture, owing to its early flowering, and it is easily obtainable in quantity at a low price. Barr's hybrid or chalice-cupped *Daffodils* may be said to resemble the varieties of *N. poeticus* in shape, but the perianth segments are of various shades of yellow, with the cup distinctly edged with orange. Of these, *Conspicuous* is a variety of marked beauty. The flowers stand out on long stems, and are remarkable for their durability. In the four varieties we have tried there is not one that could be spared. *Orphée*, *Maurice Vilmorin* and *Sensation* are good and distinct from each other. The varieties of *N. incomparabilis* need, perhaps, no description except the division that contains the well-known *Sir Watkin*, in which are classed many that are free growers and useful for cutting, such as *Stella*, which is also a good kind to force, and *Cynosure*, a bold variety, with very long stems and striking flowers. These varieties are robust growers and need plenty of encouragement, with perhaps a biennial transplanting in August, or exactly similar treatment to the *Bicolor* and *Trumpet* major kinds. *William Wilkes* is a valuable late-flowering kind, though not sufficiently established yet to bear out the character given it. *Hume's Giant* is one of the straight-crowned *Daffodils*. It is distinct from most other kinds, but the stems are short and the flowers drooping, so that it cannot be seen to advantage unless it is planted on a level with the eye, as on a rock-garden. The same is true of *N. capax plenus* as to habit; the flowers of this variety are double and consist of six rows of petals placed one above the other in the form of a star. This variety is interesting in a collection, but must be planted among the weaker-growing kinds. It has no affinity to the *Poeticus* group, the color being pale primrose-yellow. I find that very few cultivators care for double *Daffodils* and call them monstrosities, which is technically correct; but who can find it in his heart to say that wild double *Daffodils* running riot in the fields are monstrous? I have seen acres of them, and have gathered them in pasture-fields by the armful at Easter-time. The owners would willingly have paid any one

to dig out the bulbs, for cattle will not touch the *Daffodils*, and they crowd out the grass for half the season at least. Certainly a word of praise is due to *Orange Phoenix*, *Sulphur Phoenix*, *Von Sion* and the double *Incomparabilis*, not even omitting the double form of the Poet's *Narcissus*, though some one will probably tell you that it always goes blind and does not flower. Last year not one flower opened with us from newly planted bulbs; this year they are in full bloom with pure white double *Gardenia*-like flowers, fragrant and beautiful.

South Lancaster, Mass.

O.

Natural Varieties of *Narcissus Tazetta*.

NARCISSUS TAZETTA and its varieties, commonly known as *Polyanthus Narcissi*, are less hardy than most of the other species of the genus, but, with a single exception, there is no trouble or risk of loss in growing them in the open ground as far north as Boston. A light covering of corn-stalks or other material should be given, not for the sake of warmth, but to shade the ground and keep it from cracking down to the bulbs in the alternate terms of freezing and thawing which make up our winters. With such protection I never lose a bulb in the severest seasons. In sections where snow lies on the ground all winter no covering is needed. I advise the out-of-door cultivation of the finer varieties of *N. Tazetta*, the planting to be done at the end of October and the covering to be applied a month later; pot-grown specimens are poor compared with those in this way grown. I have this spring had eighteen flowers of *Grand Monarque* on a single stalk, each blossom nearly as large as those of *N. poeticus*. In its wild state *N. Tazetta* sports into many well-marked varieties, so distinct that some authors have regarded them as valid species, and many of them are figured as such by Jordan and Fourreau. I have cultivated many of these for several years, and offer here the observations I have made upon some of them.

N. Tazetta canaliculatus makes a slow and feeble growth, its longest foliage rarely exceeding nine inches, and the leaves are few and slender. The flowers, not more than four or five on a stalk, are small, their segments narrow and pointed. The color of the segments is yellowish white; the cup is light yellow. The bulbs are larger than those of some varieties of far stronger growth; they can be bought for thirty-five cents a hundred, a low price apparently, but far more than they are worth to a gardener, for this is the least attractive *Narcissus* I have ever seen. *N. Tazetta neglectus* is somewhat better in color and size, but is of little interest or beauty. *Patulus* is somewhat better, and *Siculus* is still another step upward in the scale of beauty, for in these the segments are clear, unstained white. They are, however, hardly worth growing, as far more beautiful varieties are obtainable. The form that is considered the type of *N. Tazetta* is quite attractive, though no larger than the other kinds named, for its colors are clearer and its form more graceful. *Tenorii* has comparatively broad petals and is very handsome; but the best of these Italian forms is *N. Barlæ*, which may claim equality of beauty with the best garden forms. Though not as large as some of these, it is exceedingly bright and beautiful, and its fragrance is less heavy than in most varieties of the species. *N. pachybolbos* is an Algerian kind which is ranked as a variety of *Tazetta*, though widely different from any other variety of this family. The bulb is very large and rough-coated, the foliage taller than is usual in the genus, and the flowers, pure white with light lemon cup, are very small and closely clustered. It is well worth growing for its distinctness, though it is somewhat tender and ought to have the protection of a frame. The variety *Papyraceus* is the Paper White of the florists, very pretty and early in flower, but now superseded by a seedling variety of the same color and larger growth. *Italicus* and *Obliquus* are varieties we can very well dispense with, especially the latter; they are little, if any, better than *Patulus*. Of *Beitoloni* I cannot speak; I have had it two years, but have not yet seen the flower.

I have tried seven or eight other wild varieties, most of them from Italy, of which there is nothing in particular to say. *Tenorii*, *Barlæ* and *Pachybolbos* are the only ones which have any horticultural value.

Canton, Mass.

W. E. Endicott.

The Water-garden.

IT is very pleasant, these balmy June mornings, to be greeted as one's first glances turn to the garden by the beautiful *Nymphæas* gracefully anchored in the clear pool. In the early morning the water-garden is full of animation, the flowers expanding rapidly, the fish full of activity, engaged now in ap-

parent play, and then agitating the Lily-buds as they eagerly seize some tempting morsel. The abundant frogs are not very serious, and their antics fascinate the house cat, who keeps a constant and agitated watch by the borders of the tank. Every passing cloud adds a fresh charm as it is mirrored in the water, and the swaying of the grasses to the gentlest breeze completes the picture of beauty which we are more apt to associate with some wild scene than with a small city garden. Yet such a scene of quiet beauty is easily arranged in comparatively limited quarters, and is certain to be a constant pleasure. My friends who have become inoculated with the passion for aquatics seem to be thoroughly occupied by these plants rather to the exclusion of others. Devotion to one family of plants is well for the commercial grower, but is not the most satisfactory to the owner of a garden, who should ever have in view the enlargement of his sympathies. However, the field of aquatics is rather large, there being some threescore or more of *Nymphæas* and *Nelumbos*, with many and varied plants to associate with them, while there is an almost endless list of Grasses, Rushes and Irises, which naturally associate with a water view, while in quiet artificial bogs may be developed innumerable beautiful things. To any one who is fond of tender foliage, so enjoyable usually only in early spring, the water-garden offers an opportunity to gratify this taste, so seldom satisfied in the usually hard foliage of summer plants. On the whole, the cultivation of aquatics is not to be recommended to any one who fears to have his blood stirred by the collection of fine plants, many of which are rather difficult to secure, and a daily pleasure from constantly changing beauty. To any one who cares to try an interesting experiment, it may be said that it is not yet too late to start a water-garden this season. There are few spare ponds available in ordinary gardens, and it will be necessary to arrange an artificial tank or pool. Perhaps it is better at first to make a tentative experiment, and try only a small tank. This for a single Lily may be made of a half molasses-cask sunk in the ground, or a space may be dug out eighteen inches deep, and the bottom and sides plastered with a thin coating of Portland cement. Planted in rich earth the plant will soon make rampant growth and give a succession of flowers. It would be well perhaps to attempt a *Nymphæa Zanzibarensis*, because this is a plant of rapid growth which flowers all summer. Of hardy Lilies, *N. alba candidissima* is the most satisfactory and free-flowering, and *N. chromatella* has a fine yellow flower with the same qualities. Our native *N. odorata* and the red variety are scarcely satisfactory except in collections, as their blooming season is short. The Egyptian Lotus (*N. speciosissima*) is a plant of rare and striking beauty both in leaf and flower, and is easily grown, though its true habit does not appear in the illustrations of the catalogues.

Of course, the water-garden must be placed where it will have all the sunlight possible, warmth being necessary to the growth of the plants. A few fish are indispensable, to keep the water sweet. Hardy *Nymphæas* may be wintered successfully in this latitude in a shallow tank. My tank, twenty inches deep, was covered over last winter with boards and a slight covering of leaves. At no time, even in severe weather, did more than two inches of ice form, and probably, with a thick covering of leaves, the water would not congeal. The roots of my *N. alba candidissima* wintered with their crowns within six inches of the surface, and it is now strong, vigorous and full of flowers, though not replanted this season. The other hardy *Nymphæas* all came through unscathed, as did the *Sagittarias*, except *S. Montevicensis*, which was wintered in a cold tank at thirty-five or forty degrees. This is, however, too cool for this variety, and it evidently requires a temperature ten degrees higher than this. The same tank proved fatal to *Cyperus alternifolius*, though *Hedychium coronarium* wintered safely there, as did *Nymphæa Mexicana*. This *Nymphæa* I have reason, however, to believe may be safely dried off. *Aponogeton distachyon* was the first plant to bloom in my tank, it being hardy and moving at the first warmth. The season for *Nymphæas* opened on June 1st with the flowering of *N. alba candidissima*, followed quickly by *N. pygmaea alba*, *N. chromatella* and *N. Laydekeri rosea*. Numerous buds on the other varieties promise soon a wealth of flowers.

Elizabeth, N. J.

J. N. G.

Notes from the Harvard Botanic Garden.

ANEMONE ROBINSONIANA.—This little plant is again in full bloom, and it has a very charming appearance in sunny weather, for it is only under such circumstances that the flowers expand fully. The foliage forms a close green carpet from six to nine inches high, and it is thickly studded with the pale

blue flowers, which are an inch and a half in diameter, and are borne on erect slender stalks three or four inches long. Dull or wet weather is exceedingly injurious to the blossoms, and causes them to close and decay prematurely. The plant is a form of the common *A. nemorosa*, and was first discovered in an English wood some years ago. It is perfectly hardy, and thrives well in partial shade, preferring a moderately dry situation and good garden-soil. It is seen to greatest advantage in a somewhat sheltered and lightly shaded position in the rock-garden, and it should never be disturbed unnecessarily. The groups that have been longest established are always the most attractive during the flowering season, however luxuriant those of more recent formation may be at other times.

CAMASSIA ESCULENTA.—The Camass, or Quamash, is now at its best. It has linear leaves of pale green color, and about a foot in length. The erect racemose scapes, from twelve to twenty-four inches high, are produced in great abundance, bearing along the upper portion numerous spreading bright blue flowers, two inches in diameter. The divisions of the flowers are keeled and of oblong form, and the yellow anthers, at the apex of filaments nearly equal to the segments in length, are showy for some time after the flowers open. It is an excellent plant for a partially shaded situation, and it also thrives fairly well in the sun. A deep, rich sandy soil is the most satisfactory, and the offsets of the bulbs afford a ready means of increase, as do the seeds. The latter ripen in summer, and should be sown as soon as possible after maturity. *C. esculenta* is a native of the western and southern parts of the United States, and it has been in cultivation as an ornamental plant since 1837. The roots are used as food by certain tribes of Indians, and it is said that bears are very partial to them. It is not perfectly hardy in this part of the country, requiring a moderate covering of leaves or dry litter in the winter months. *Scilla esculenta* is a name often given to this plant, but *Camassia* appears to be the more popular generic term. There is said to be a variety, *C. esculenta Leichtlini*, with white flowers and a more robust constitution. A plant with these characters would be extremely desirable, and I should like to hear something about it from any one who has ever grown it or has seen it growing.

PULMONARIA SACCHARATA.—None of the *Pulmonarias*, or Lungworts, are very common in American gardens, and this species is no exception to the rule. It is, however, well worth growing in a mixed collection. The height seldom exceeds twelve inches, and the habit is spreading, with branches freely produced, thus forming a neat plant for the herbaceous border or for planting with alpine. It is a thoroughly hardy perennial, and the stems are clothed with elliptical or oblong, alternate leaves. The lower leaves are generally narrowed down to a rather long petiole, while those above are strictly sessile. All are dark green, with a profusion of large and small spots and blotches of whitish color, which give them a decidedly curious appearance. The variegation, at any rate, is of quite an uncommon order among hardy plants, and more like the irregular kind so often found in tropical vegetation. The flowers appear in May and June, and are borne in compact terminal racemes of six or seven. They are five-lobed, somewhat spreading, and generally of a bright blue color. But here we have a rather interesting example of flowers of different colors appearing simultaneously upon the same stalk, as it is very common to find pink flowers and blue of the same age on a single stem of *P. saccharata*. This phenomenon, however, is not confined to *P. saccharata*. It occurs in several other species of the same genus, and invariably attracts attention. After the flowers disappear the leaves become larger, and their variegation becomes more intense. The plant retains this attractive appearance until late in autumn, the driest summer failing to affect it to any appreciable extent. It will thrive almost anywhere, but the variegation is brightest and it flowers best in a sunny position where the soil is not very rich. *P. saccharata* is a native of south Europe, and has been in cultivation upward of seventy years; it is propagated by division in early spring.

SCILLA CAMPANULATA.—The white form of this plant, known as the variety *Alba*, is now in bloom. It is the exact counterpart of the species in everything except the color of the flowers, which are pure white. There is another variety, *Carnea*, in which the flowers are of a beautiful pink shade. All three are natives of southern Europe, and they have been cultivated since 1683. Large patches of the three kinds in mixture make a handsome display, as they usually all flower at the same time. The margins of long stretches of shrubbery are much more beautiful in spring if care has been taken to give these plants a place in the border. In this case they are most effective when planted in clusters of the same color. The good

qualities of these plants are their complete hardiness and their satisfactory growth without the least attention after planting. Even in the grass of the wild garden they thrive and bloom year after year, and there is no situation in which they are more pleasing and effective.

STELLARIA HOLOSTEA.—European gardeners do not think much of this plant, presumably because it is quite common in many parts of their continent, including England. But there are some who give it a place in the garden, and their pains are well rewarded by its neat tufts of bright green foliage, which are completely covered in May and June by spreading snow-white flowers three-fourths of an inch across. *S. Holostea* lacks that character of weediness for which all other *Stellarias* are chiefly noted; and in this country especially its habit is more compact and the flowers are produced with far greater freedom than in its native home. This is doubtless due in some degree to the drier atmosphere and greater warmth of our spring and summer. The height of the plant under ordinary circumstances is about nine inches, but in dry places it is often much less. The opposite leaves are sessile and lanceolate. The tufts soon attain large dimensions, for the roots are of a creeping disposition, a fact which renders the plant extremely easy of propagation by division. It is an excellent plant for the front of an herbaceous border, preferring a sunny position and soil of medium depth and fertility. Some portions of the rock-garden suit it very well, and it is always charming wherever it can be induced to grow.

VERONICA GENTIANOIDES.—It is nearly one hundred and fifty years since this pretty Levantine Speedwell became known in gardens. The plant has creeping roots and is of erect habit, varying in height, according to soil and position, from six to twenty-four inches. The radical leaves are lanceolate, obtuse, from three to six inches long, smooth or slightly pubescent and of rich green color. The stem-leaves gradually diminish in size toward the top, and ultimately become mere lance-shaped bracts among the flowers. The flowers are rather more than half an inch across, and are borne in compact terminal racemes. They are very pale blue, with numerous lines much darker in color. It is one of the earliest species of the genus to flower, being in full bloom about the middle of May, and lasting well into June. No special care is required to grow it well, as it thrives in almost any soil or location, and the dense patches of verdant foliage impart a refreshing appearance to semi-barren spots during the scorching months of summer. The plants grown in shady places, where the soil is rich, are, of course, much more vigorous than those given poor soil and full exposure to wind and weather. There are many parts of the rock-garden in which it will be at home, for it is one of our hardiest plants, and a genuine alpine. There is a dwarf form with variegated foliage which is useful in formal bedding. Division of the roots is the most expeditious method of propagating both plants.

Cambridge, Mass.

M. Barker.

The Pear Psylla.

PEAR orchards in some sections of New York have been seriously injured by a small, sucking insect, commonly called the Pear psylla. It appears to be particularly abundant in the Hudson River Valley, but orchards in the lake-regions of the western part of the state have also been seriously injured. This insect was uncommonly destructive during the past year. At the Cornell Station experiments have been made to determine at what stage of its existence the pest may be most successfully treated. Mr. Slingerland, assistant in the entomological department, has had charge of the work, and has arrived at some interesting conclusions.

The Pear psylla, which did so much damage during the past summer, is probably a new species. In general appearance it closely resembles the cicadas or "locusts," but the mature insect is only about an eighth of an inch long. Mr. Slingerland found adult forms in crevices of the bark during winter and early spring, and it is probable that the insect passes the winter in this form only, as no eggs could be found. During April and early May these adults lay their eggs, generally near the ends of the smaller twigs. The eggs are very small, ovoid, and of a shining yellow color. They hatch in about three weeks, the time depending somewhat upon the weather. The young insect is quite flat. The insects soon crawl toward the extremities of the shoots and begin operations among the petioles of the young leaves or upon the young shoots. Some are also found upon the midveins of the leaves. These immature forms secrete a nectar or honey-dew in such quantities that sometimes the secretion in two days will be equal in amount to the bulk of the insects themselves. It is probable that the viscid substance which was so abundant upon affected

trees last year was not the sap of the tree, but was the secretion of the insect. Later in the season affected branches assumed a black, sooty appearance. The number of broods produced in a season has not yet been determined.

Mr. Slingerland has tried a number of insecticides for the destruction of the eggs and the immature forms. Eggs were dipped in several solutions, but even pure kerosene failed to kill them. It seems doubtful if the destruction of the eggs is practicable. The trees were sprayed with Riley's kerosene emulsion as soon as most of the eggs had hatched. A few days later fully three-fourths of the young insects were dead. This result is very encouraging. If further experiments verify the results, the Pear psylla is practically under control. It must be remembered, however, that this season has been exceptionally rainy, and the viscid substance in which the insect appears to delight in burying itself has probably been washed off as soon as it appeared, thus allowing the emulsion to reach the insect. Last year was dry, and during early summer it was utterly impossible to strike the pest with any applications. The fact that the young insect can be destroyed by the kerosene emulsion is, nevertheless, of the highest importance.

Cornell University.

E. G. L.

Correspondence.

The Color and Form of Houses.

To the Editor of GARDEN AND FOREST:

Sir,—Gratitude is due from your readers to Mrs. Robbins for recommending, in a recent number of GARDEN AND FOREST, the use of warm quiet colors in the painting of houses. In the article alluded to it is justly intimated that it matters little what may be the color of suburban and country houses in summer when surrounded by a wealth of foliage. But when the leaves have fallen, all defects of outline and all crudeness of tint come into bold relief in our clear, thin atmosphere. The house divested of its natural embellishments should, by the faultlessness of its structure, satisfy the eye as perfectly as does the architecture of the tree when stripped of its leaves. But this is far from being the case, and nature in America does not willingly cloak architectural frauds or blend inharmonious hues. The clouds, even, do not descend as in England, to envelop and give an added charm of mystery to form and color, and the Lichens, which mellow and adorn stone walls quite generally, hold themselves aloof from wood.

The house which requires to be painted is at best a makeshift. Although the wooden house may be cheap in the beginning, the annual expenditure for paint and putty, in the long run, makes it both expensive and unsatisfactory. It is therefore surprising that the thrifty New Englander should continue to endure this added strain upon his purse and patience; but there are men of whom it cannot be said "they builded better than they knew." On the contrary, they have, in a certain sense, built less well. It often happens that in youth the imagination is dazzled by a house more showy than beautiful, or, in spite of its defects, it may be endeared by home association. These recollections are lasting, the mind is haunted, and, as it were, pre-empted by them, and in a measure is cut off from receiving new impressions. It therefore follows in the course of time, when fortune is achieved and a plot of land bought, that the house intended to adorn it is constructed with reference to past standards of excellence rather than in accordance with present opportunities and knowledge.

Stone and brick are the appropriate materials for buildings. Their natural color is beautiful and suited to the temperature and atmospheric conditions of all seasons. The boulders which abound in every New England field furnish abundant material for country houses. In the hands of a skillful architect, when combined with unpainted shingles, they produce a grateful effect of solidity and repose. Such houses seem to have emerged by a natural process of growth from the earth itself, and harmonize with the landscape as no other colors or materials would. The vines which grow about them appear to be an integral part of the structure, and render other embellishments superfluous; nor is there the same need, as with frame-houses, for constant painting and repairing, advantages not to be esteemed lightly where there are so many petty cares connected with hasty workmanship and perishable materials.

Moreover, in the use of brick and stone it is almost impossible to be vulgar; at any rate, it requires a deliberate effort to be so. With wood, on the other hand, every architectural abomination is possible. The ease with which it is worked has rendered it the most available material for meretricious ornament; it has of late years fed the insatiate jig-saw and stimulated the already unbridled passion for the paint-pot. The

beaded-bed-post-broken-bottle style of architecture with which we have recently been afflicted has given unlimited opportunities for indulging perverted taste, and furnished an excuse for the use of the most varied and inharmonious tints. In truth, so far as color is concerned, there has been a veritable orgy which has put to blush the chaste green and white employed by the more circumspect builders of the past. Instead of striving for kaleidoscope effects, with our white lights and white heat, we should rather seek subdued and restful colors and all other tranquilizing influences to quell the feverish perturbation of our modern life.

Since the wooden house, at best, has a thin and unsubstantial appearance, it is all the more necessary to atone for these shortcomings by adopting such colors as suggest warmth and stability; the light browns and warm shades of grays are, therefore, preferable to the glaring yellows or frigid white which, during our winter months, make a house about as inviting a refuge as an iceberg. One would as soon expect a cup of tea or other warm civility at the hands of the woman who plays the zither in the ice-cave at Grindelwald as from the inmates of these chilly-looking mansions.

It should become a recognized part of the moral code that those about to paint should submit a choice of colors for the approval of residents in the immediate neighborhood, for the question of color is one of more importance to those who dwell without than within the house. By the neglect of this precaution the beauty and harmony of a whole street is often spoiled by applying to one house a color which is discordant with every other. If the prevailing tone is quiet and unobtrusive, the introduction of bright yellow or glaring white may become, by contrast, thoroughly obnoxious and irritating and a cause of complaint as well founded as that evoked by any other act of violence. It is said that once when Turner visited a gallery of pictures where one of his own was on exhibition, he found its beauties entirely obscured by the proximity of a painting much stronger in tone; he at once heightened the value of his landscape by adding a bright spot of vermilion, which completely annihilated everything in its immediate vicinity. This high-handed measure is perpetrated daily in inoffensive communities, where hanging committees are unknown, and therefore without the provocation which a Turner could claim.

As a rule, Americans do not seem to be endowed with a sense of color, and hitherto the public in this respect has received scant education at the hands of its natural preceptors, the architects. Until quite recently, as a class, they have lagged behind the intellectual advance of the nation, although there was never so golden an opportunity for men of this profession as that presented by this vast unbuild continent. It is true that the building of cheap houses for the multitude is not so inspiring as the construction of cathedrals, palaces and town-halls; nevertheless, the magnitude of the undertaking ought in itself to have stimulated and engaged the highest talent of our people. It is computed that the cost of providing house-room for the increase of population alone will in 1893 reach the large sum of \$192,000,000.

The present architectural awakening gives assurance that the millions destined for future building purposes, in the older parts of the country at least, will be tolerably well spent; but there are immense tracts of land which lie open to the spoilers' hand. The jig-saw has already commenced its direful work south of Mason and Dixon's line, and pea-green houses bear witness to the so-called "march of progress." There is, however, some consolation in believing that the license which the builder has hitherto allowed himself in the handling of wood may in the end, when this accustomed freedom is held within bounds by discipline and self-restraint, redound to his glory and enable him to give breadth of treatment in his use of more enduring materials.

Cambridge, Mass.

S. P. S.

A May Outing.

To the Editor of GARDEN AND FOREST:

Sir,—The enjoyment of the spring-time is largely a matter of imagination and of anticipation to one who lives in the city, and who sees the return of spring only in the budding of street trees and in the grass upon the open space about some of the houses, while he waits for a chance holiday for an outing in the fields and woods.

Holidays are all the more enjoyable on account of their rarity. Of them all Decoration Day is the best, for Nature has now done her decorating, and no luxuriance later in the season can increase the beauty of the flower and foliage of this time. Wild flowers are abundant, and even the aristocratic Orchids are

largely represented among the native flowers that grow around this Urbs in Horto.

In a wood principally of low Scrub Oak, we found on last Decoration Day a great many Lady-slippers (*Cypripedium parviflorum*) growing luxuriantly and in full bloom. To compensate for carrying away the roots of some of the plants, we fertilized a number of the blossoms of those we left, so as to make sure of a crop of seeds for next year independent of the visits of any insects. Some of the poorer kinds of *Habenarias* were near by, and about a mile distant we found *Cypripedium pubescens* blooming on the open road-side without any shade whatever. These flowers are a brighter yellow than those of *C. parviflorum*; they are larger and deliciously fragrant, suggesting the aroma of apricots.

A small boy offered to show us where the "red ones" (*C. acaule*) grew, and also to take us to fields of the little white-flowering *C. candidum*, of which he had a quantity of the blossoms. He also knew where the large white and pink flowers of *C. spectabile* would be in bloom in a few weeks. The little Ram's-head (*C. arietinum*) is sometimes found here. This makes a list of six *Cypripedium*s natives of this locality.

Besides the *Cypripedium*s there were blue Lupines, the bright scarlet and yellow Painted Cups, the pretty little yellow stars of *Hypoxis erecta* and the pink *Phlox pilosa*, of which a beautiful pure white specimen was found; many other floral treasures added interest to our day's outing, all too quickly passed.

Chicago.

F. J. Le Moyné.

American Species of Ash.

To the Editor of GARDEN AND FOREST:

Sir,—It will, perhaps, be interesting for the readers of GARDEN AND FOREST to see what I consider the exact list of the species of *Fraxinus* of the New World. It is the one which I have adopted in my monograph of *Fraxinus*, read before the Royal Botanical Society of Belgium at the meeting held on May 1st. My reason for asking you to publish it in your interesting and learned journal is, that I may make known to American botanists my understanding of the American species, and to obtain their criticism upon my observations made in the principal herbaria of Europe. My idea of the limitation of the species in the genus *Fraxinus* has compelled me to reduce considerably the number, which is more than a hundred; and I have reduced those of the United States to five, admitting, however, a certain number of sub-species. This conclusion, based on a profound study of the fruits and leaves of all available material, will, perhaps, appear reactionary to many botanists, but it is only after having seen a great deal that I have arrived at my conclusions.

I shall be very glad to arrange to exchange specimens of the ligneous plants of Europe for those of North America.

AMERICAN SPECIES OF THE GENUS FRAXINUS.

Wing of the Samara, not prolonged to the base.

I. *F. SCHIEDEANA*. Schlecht et Cham.

II. *F. AMERICANA*.

1. Sub-species: *Typicum*.

i. Variety: *Normale*—*F. Americana*, L.

1. Sub-variety: *Discolor*, Muhl.

2. " *Acuminata*, Lamk.

3. " *Epiptera*, Michx.

4. " *Pistaciæfolia*, Torr.

2. Sub-species: *Novæ-Angliæ*, Mill.

i. Variety: *Berlanderiana*, DC.

3. Sub-species: *Pennsylvanica*, Marsh.

i. Variety: *Longifolia*, Vahl.

1. Sub-variety: *Aucubæfolia* hort.

ii. Variety: *Sub-pubescens*, Pers.

iii. " *Latifolia*, Willd.

iv. " *Rubicunda*, Bosc.

4. Sub-species: *Oreganæ*, Nutt.

III. *F. NIGRA*.

1. Sub-species: *Nigra*, Marsh.

2. " *Caroliniana*, Mill.

IV. *F. QUADRANGULATA*, Michx.

V. *F. ANOMATA*, Torr.

Nancy, Belgium.

Alfred Wesmael.

Hardy Plants at Passaic, New Jersey.

To the Editor of GARDEN AND FOREST:

Sir,—I went over to Passaic, New Jersey, a few days since to see the early summer flowers in Woolson & Co.'s Nursery. Pæonies are widely distributed plants, but it is only in a nursery where they are grown by the acre that the full effective-

ness of their massive flowers may be seen. An acre of these plants in flower, though planted in nursery rows, makes a wonderful glow of color on a bright June day. From the very extent of the view the flowers lose somewhat of their solid individuality, and one is half-intoxicated with the barbaric wealth of color above the foil of ample foliage. The ordinary Pæonies of the garden are apt to be washy purples or blue-reds, which jar with the orange and scarlet flowers of the same season. It was pleasant to see that such colors are very rare in this nursery, the more modern pink, rose, salmon, blood-red and white varieties seeming to comprise the majority of the collection. The single varieties of Pæonies are very taking, with their comparatively light, yet large Anemone-like flowers. Albiflora is a good one of these; the color is rather variable from white to a delicate rose, with a bunch of golden stamens. Baron James Rothschild is another form, semi-double, showing the stamens, and of a good pure pink. Of the massive double varieties I fancied Blanche, pure white, Rubra Triumphans and Proserpine, both very dark, clear blood-red. Of the rose and pink varieties, mostly with broad petals and full centres of narrower petals, a very effective form, some of the best were Hercules and Duke of Wellington, with blush guard petals and white inner ones; Rosa elegans, blush; Reine des Roses, guard salmon, centre flesh color; Cydonie, rose, very large guard petals; Plenissima, pink. Of the newest varieties under trial two extra fine ones were Mire de Soufflé, with white guard petals and distinct sulphur centre, and Charles Toche, semi-double, of a deep clear bright rose. Colors of Pæonies do not admit of strictly accurate description, as they vary according to the age of the flower. It is possible to have a long season of Pæonies, for the Moutan and tenuifolia varieties are past before the first of the common herbaceous kinds open. Of these there are a number of kinds just budding, which will extend the season a fortnight longer. L. d'Estrees, Monsieur Bonquiel and Delachei were noted as some late kinds.

The stretches of German Irises were the next plants of interest. These, of course, lack the brilliant effect of the Pæonies, but form unique colors in mass, while they are very interesting individually, and many extremely handsome. German Irises, so called, are simply bearded kinds, mostly hybrids of half a dozen species, and the great number of kinds grown by the florists can be divided into that number of sections. The varieties of these sections, which vary more or less, have the same general form and coloring. The old purple Flag is known everywhere; a deeper-colored variety is D. R. Parnot. Iris pallida seems to me one of the best of species for the garden. The plant has broad leaves and a bold habit, and the large fragrant flowers are light lavender, with orange beard. The hybrids are also very attractive. Zephyr, a very light lavender with graceful habit, William III., heliotrope, and Queen of May, rose, are all distinct. The varieties of I. aphylla have mostly white standards and falls flaked blue or rose. Madame Chereau is a well-known handsome kind. The varieties of I. neglecta have mostly lilac standards and falls of purple or purplish crimson reticulated white. Fairy Queen and Cythere are good samples of this section. The bronze and smoky varieties are descendants of I. sambucina or I. squalens. Victory, Violetta and Leopard are good examples of these. I. variegata is an effective yellow species which has given many handsome and useful varieties, mostly with yellow standards and reticulated falls, browns and deep reds. Striata, Cerberus, Jenny Lind and Monsieur de Lesseps are distinct kinds of these. Among the numerous true species of Irises now in bloom very few are effective, though they are interesting garden-flowers, but a group of I. orientalis showed a splash of very effective purplish blue. Some of the Japanese Irises were in bud, and these will closely follow the German Irises, prolonging the season through June and early July.

There are always many interesting things in a large collection of hardy plants, but when one passes from the general favorites or certain families one rather hesitates to recommend even striking plants, since the satisfaction to be derived from many depends so much on the special taste of the grower. No plants require to be more carefully selected, and frequent visits to nurseries are essential to a satisfactory selection of unknown things. Still I noted many favorite plants in flower. The Pinks were represented by broad stretches of Dianthus atrorubens, D. deltoides, D. plumarius, etc. At this time the yellow Day Lilies (Hemerocallis) are seen in great masses. Our old friend, H. flava, is clear and pure, but not as effective as the orange variety, H. Mittedorfiana. Of the Plantain Lilies, grown in great variety, the newest is Thomas Hogg, which struck me as a very distinct kind, with broadly margined leaves.

A hardy garden is not complete without Rosa rugosa, which

is so extensively grown, but its beauty as a screen or broad hedge never appeared to me so forcibly before as I saw it here in a solid row some hundreds of feet long of large plants, with the wealth of beautiful dark green foliage, which was a picture, without the attractive flowers. But the picture I carried away with me with the greatest pleasure was that of a mass of Rosa rubrifolia, a Rose with stems and foliage of a lustrous soft red. Furnished as it is at this season with the lovely single flowers, it is a treasure for any garden.

New York.

7.

Recent Publications.

The Oak: A Popular Introduction to Forest-botany. By H. Marshall Ward, F.R.S. New York: D. Appleton & Co., 1892.

This is the third volume in the Modern Science Series, edited by Sir John Lubbock. The plan is quite similar to that of the International Scientific Series, but the works are intended to be less technical. This volume is a neat and well-made book of a hundred and seventy-five pages, illustrated by two plates showing the English Oak in summer and in winter, and more than fifty figures in the text showing points of structure. The eleven chapters treat of germination; the seedling and tissues, tissue systems and organs; the tree—its root, stem, flowering and fruiting organs; oak-timber, cultivation, diseases; relationships and distribution in time and space.

The story of the Oak in this logical sequence is told with considerable fullness and with few technical terms, but, after all, it is by no means light reading. To write an interesting book on microscopic structure for laymen is not an easy task. From most points of view this work has been successfully accomplished by Professor Ward, but it must be admitted that the style is rather heavy and monotonous; that the main facts do not stand out from the mass of details in sufficiently strong contrast, and that their relationships to each other are not made sufficiently clear. Even the botanist will find that close attention is required if he is to get an adequate comprehension of the work. The author dwells briefly upon gross structure, and proceeds almost immediately into the microscopic characters, and holds to this treatment almost throughout the book. These objections are mentioned because the book is offered for the general reader, who is not properly equipped for the task set before him. The language used is very condensed, every chapter is full of facts, and the careful student may gain from them a good knowledge of the structure, growth and fruiting, not only of the Oak, but of the entire class of dicotyledonous plants. The chapters on structure are too full to be summarized here. They describe the various kinds of cells and tissues as they exist in both young and old plants. The leaf-trace and the arrangement of the fibro-vascular bundles are explained. The suggestion is made that the symbiotic mycorrhiza, which seems to perform the office of root-hairs, may possibly be mycelium of the Truffle. The fact that Oak-woods are the special habitat of the Truffle would tend to strengthen this view. The chapter on Oak-timber treats by paragraphs of appearance and structure, density, water and drying, swelling, elasticity and tenacity, flexibility, torsion, splitting, hardness, durability, burning properties, peculiarities, uses. Under "Durability" we learn the interesting facts that a piece of oak-pile taken up from a London bridge in 1827 had lasted for 650 years, and that another piece from the Tower of London was probably put in when the Tower was built.

Under "Cultivation" is an interesting statement, credited to Hartig, that Beech-trees store up nitrogenous materials and salts for seventy or eighty years, then suddenly yield them up in an abundant crop of seeds. This is such an exhausting process that three to five years are required to accumulate materials for another crop. Is the alternation of bearing and sterile years in fruit-trees to be similarly explained?

Various insects and fungus enemies of the Oak are referred to, and a number of the latter illustrated in their effects by figures from Hartig. The closing chapter sets forth the abundance and wide distribution of Oaks in the northern hemisphere and the great antiquity of the race.

Notes.

By an annoying oversight *Ascyrum Crux-Andreae* was called *Asarum* in our issue of June 1st, and the error was repeated in the text of the article describing it.

The Virginia Fringe-tree (*Chionanthus Virginica*) has been in flower for more than a week, and it is as attractive as ever. This is one of our smaller native trees which, taken together with our Cornels, Viburnums, Thorns and Sumachs, make a

group unsurpassed in beauty by any similar collection from any part of the world.

An annual scholarship in botany has just been founded at Barnard College for young women by a benefactor whose name has thus far been withheld.

Mr. J. W. Menzies has calculated that the price paid to France by the United States in 1803 for the region which now forms the state of Louisiana amounted to one penny and one farthing per acre for land most of which was of high fertility.

According to a report of the United States Minister at Stockholm, the greatest source of revenue to the kingdom of Sweden is its forests. That portion of the country which is called the Norland is still, for the most part, covered with extensive forests largely composed of Pine and Spruce.

Miss Clara E. Cummings, of Wellesley College, Wellesley, Massachusetts, requests us to make known that she can supply copies of the catalogue of the Musci and Hepaticæ of North America north of Mexico at the greatly reduced price of twenty-five cents each, postpaid. It is based upon the *Manual of Mosses of North America*, by Lesquereux & James, and the *Descriptive Catalogue of the North American Hepaticæ*, by L. M. Underwood.

The China Aster, which is the most popular of summer flowers in France, and is there called the Reine Marguerite, was introduced into that country about the year 1730 by the famous Jesuit, Father d'Incarville. "To-day," says a recent French writer, "there are more than twenty distinct strains of China Asters, and as each includes from three to twenty different colors, it is no exaggeration to affirm that there are more than two hundred distinct varieties of this beautiful flower."

Mr. T. D. Hatfield writes to commend a variety of Phlox subulata, which was selected as a seedling from the form known as The Bride, and which has been named Sadie. When all the other Moss Pinks are past this one is still in full bloom. It is a clear blue, and much better than the only other blue dwarf Phlox (*P. stellaris*). He also states that there are three varieties of the true bedding Violets which come tolerably sure from seed and take care of themselves in the rock-garden, which seems quite as appropriate a place for them as the border. These varieties are known as Snowflake (white), Yellow Gem and Perfection, both of which are purplish.

Some members of the Agassiz Association, at Forreston, Illinois, having observed that the plow and spade, with the reaper and mower, had been driving many of the wild flowers from their native haunts into byways and fence-corners, where they easily fall a prey to rooting swine or reckless plant-pullers, have established an asylum for these hunted children of the woods, and will attempt to preserve them from extinction. Spring Beauty, Painted-cup, Trillium, Bloodroot, Dicentra, and many other flowers which are threatened with extermination have been gathered into this garden of refuge, which, we have no doubt, will grow in interest and usefulness for many years to come.

An idea of value now set upon large estates in Great Britain may be gathered from the recent sale of Craig Castle, in Aberdeenshire, Scotland, which is described in *Truth*, of London, as "a fine sporting and residential estate," extending over 4,640 acres, and consisting of "an excellent house with beautiful grounds, which include the picturesque Glen of Cray and the celebrated Buch of Cabrach." The price given for the whole property was only £33,000, not more than some Americans have paid in establishing what they call mere "villas" at Newport. The castle had belonged to the family of the Mr. Gordon, who has just disposed of it, since the year 1499, and Mary Queen of Scots signed the warrant which confirmed its possession to the son of the original grantee.

It is good news for the poor of our city that protected areas along the river-fronts are being arranged to afford them fresh air and comparatively quiet places of repose. The pier at the east foot of Jefferson Street is at once to be shedded and the roof railed about for a free promenade; and the large pier at the foot of West Thirty-fourth Street is to be fitted with an awning and rows of benches, and will be thrown open to the public about the middle of June. Each of these places, of course, commands a wide prospect of blue water, and from the latter one the splendid panorama of the western banks of the Hudson is revealed; and the lack of green and growing things in the foreground will be partly made good by the free sweep of an air much cooler and fresher than that which circulates through parks in the heart of a town. The way in which

the poorest classes of the city through the piers in midsummer days and nights, even when no roof protects them and no seats welcome them, should inspire our authorities to establish as many as possible of these novel breathing-spaces.

Florists who force Bermuda Lilies naturally wish to get the bulbs as early as possible, and to meet this demand the growers have been digging them earlier each season, until the practice of shipping before they have sufficiently matured is not uncommon. Messrs. Peter Henderson & Co. have been writing to some of the florists who force this Lily on a large scale to ascertain their opinion as to the value of these unripe bulbs. Men who have experience in forcing, like Robert Craig, I. Fosterman and James Dean, give emphatic opinion as to the necessity of leaving bulbs in the ground until they are thoroughly ripened. Mr. Craig states that the early bulbs, which are soft and flabby, do not root well. Mr. Fosterman adds that the flowers from such bulbs do not keep. Mr. Dean says that the earliest bulbs have a flimsy texture, and when used for early forcing will either come blind or have many imperfect flowers. He adds that a bulb fit for forcing should be a bright yellow color, with the scales hard and of good substance. If left in the ground until thoroughly ripe the scales will have covered the old flower-stalk.

Monsieur Gadeau de Kerville is now publishing a large book on the ancient trees of Normandy, which is described as being very interesting. Among the remarkable specimens which he has thus far noticed are two Yew-trees which stand at La Haye de Routot, in the Department of the Eure, and which he estimates to be not less than 1,500 years old. The larger of the pair measures nine and a half metres in circumference at the base of the trunk and seventeen and a half metres in height, while the other girths eight and a quarter metres and is fourteen and a half metres tall. In the hollow trunk of one forty persons have sometimes gathered, and concerts have been given by eight musicians; but it has now been transformed into a chapel, which is ten feet high and nearly seven feet in diameter. At Montigny, says Monsieur de Kerville, stands a famous Beech-tree which must be between six hundred and nine hundred years old, and is eighteen metres in height and eight and a quarter metres in diameter. Some of the Oaks which he describes he believes to be from two hundred to nine hundred years old, and one of them is forty metres in height.

Most persons are familiar with the prettily marked stones which are called "moss agates" and which appear to contain perfectly preserved bits of a moss-like vegetable growth. It is commonly believed that such agates and other similarly marked stones, grouped under the name of dendrites, really contain fossilized plants; indeed, both of these names bear witness to the antiquity and generality of the mistake. As Monsieur Stanislas Meunier recently explained in an article called "Dendrites," published in *La Nature*, "it is easy to discover that dendrites have none of the characteristics of the vegetable ramifications with which we are inclined to compare them; and when we study them under a sufficient magnifying power, the crystalline structure of the greater number of them is very distinctly apparent. Particularly is this the case with the black dendrites which are most common and which I have studied with especial care and have succeeded in producing artificially. It is plain that these dendrites, consisting of a hydrated oxide of manganese, result from a precipitating action exercised by calcareous rocks on water containing traces of metallic salts."

From a recent issue of the *Revue Horticole* it appears that Monsieur Maxime Cornu, Professeur de Culture at the Jardin des Plantes, at Paris, exhibited before the National Society of Horticulture of France a flowering specimen of *Incarvillea Delavayi*, one of the new plants sent by the Abbé Delavay from Yunnan. It is a perennial plant with tuberous roots, dark green denticulate leaves, and handsome rose-colored flowers, which resemble in form those of *Tecoma radicans* and which last for a week without fading. In the climate of Paris *I. Delavayi*, like the other plants introduced from Yunnan, requires the protection of a cold house or of a frame. Other plants introduced into cultivation from the same country by this intrepid traveler and distributed from the Muséum are *Thalictrum Delavayi*, a beautiful species with blue flowers, *Primula calliantha*, *P. Poissoni*, *Kœlreuteria bipinnata*, a real addition to handsome small trees and remarkable for its enormous leaves and long clusters of flowers, although, unfortunately, not hardy in the northern states, *Rhododendron Bureari*, *R. cilicilyx*, *R. decorum*, *R. fastigiatum*, *R. lacteum*, *R. racemosum*, *R. Yunnanense*, *Berberis pruinosa*, *Desmodium longipes*, *Indigofera Delavayi* and *Desmodium pendulum*.

GARDEN AND FOREST.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLE:—The Plan of the Columbian Fair Grounds. (With map.)	289
A Rural Cemetery Mrs. J. H. Robbins.	290
Weeds in Southern New Jersey Mrs. Mary Treat.	292
Mid-June in West Virginia Mrs. Danske Dandridge.	292
FOREIGN CORRESPONDENCE:—London Letter W. Watson.	293
NEW OR LITTLE-KNOWN PLANTS:—Cape Ivy (<i>Senecio macroglossus</i>). (With figure.) W. Watson.	294
CULTURAL DEPARTMENT:—Notes on Shrubs J. G. Jack.	294
The Wild Garden M. Barker.	295
Flower Notes J. N. Gerard.	296
Hardy Plant Notes E. O. Orpel.	296
Iris cuprea, Iris ochroleuca, or I. gigantea, Iris Anglica J. N. G.	297
THE FOREST:—The Woods of Minnesota H. B. Ayres.	297
CORRESPONDENCE:—Impressions of America.—I. Cealia Waern.	298
The Wellesley Gardens M. Barker.	298
Albinos among Orchids J. F. Collins.	299
Preference of Birds for Certain Trees H. J. K.	299
The Effects of the Winter J. Vroom.	299
NOTES	300
ILLUSTRATIONS:—General Plan, World's Columbian Exposition	291
<i>Senecio macroglossus</i> , Fig. 53	295

The Plan of the Columbian Fair Grounds.

MORE than twenty years ago a design was prepared by Messrs. Olmsted, Vaux & Co. for laying out three tracts of land which were known together as South Park, Chicago. One of these tracts is now Jackson Park, the site of the Columbian Exposition. Among the striking features of this plot of land, as pointed out in the report accompanying the plan alluded to, was its long frontage on the lake, which, in the opinion of the designers, added an element of such grandeur and sublimity that it compensated for the absence of picturesque elevations of surface, while at the same time it provided means of transportation by water from the city, whose business centre was some seven miles away. It was stated further that one-third of the surface of this land lay below the high-water level of the lake, and that a great part of the remainder was too low, too wet and too cold to maintain upland trees, while adequate drainage was nearly impracticable. It was suggested, therefore, that excavations should be made in the more depressed portions of this area and that the material taken out should be used to raise the adjacent ground above the lake-level, and that a free outlet should then be made through the beach to admit the water of the lake into a central lagoon, with various branches and ramifications, so that the element of water would be the most prominent one in the park. The commanding exterior feature would then be the lake, with its storm-beaten shore, and within would be the intricate and sequestered scenery of the lagoon, all its parts connected together and with the lake by a continuous stretch of water.

When it was finally decided that the Columbian Fair should be held in Jackson Park this scheme of inland waterways was taken as the fundamental idea of the general design. The ground was still unimproved, and it lay, as it had lain for centuries, in a series of ridges and hollows as the sand had drifted up in successive waves. The hollows were spongy swale lands, and it was determined to dredge

out enough of the light soil from them to make waterways of sufficient breadth and depth for convenient transportation and wide enough to form a feature in the scenery, while the earth which was removed would suffice to make a foundation for the stately buildings to be reared on their banks and lift them some ten or twelve feet above the high-water mark of the lake. In working out this plan more than a million cubic yards of earth have already been removed. The interior waters have an area of more than fifty acres, and provide a circuit of three miles for electric omnibus-boats.

The direction of the lake shore dictated the line of the buildings, and, of course, controlled the direction of the canals, and, in a measure, the shape of the lagoon. The largest building, that of Manufactures and Liberal Arts, an immense structure, which is fully a mile in circuit, is placed (see map on page 291) nearly on the centre of the lake-front and directly facing it. Since the southern face of this building forms a part of a great quadrangle, the other buildings, whose façades form the remaining part of the enclosure, are built on the same parallel lines. Extending from the lagoon and following the line of these buildings is a walled-in canal, which opens into a larger basin of the same formal character set at right angles with it. This basin also connects with the harbor and occupies the central and most important part of the quadrangle. The quadrangle itself, which is 2,000 feet long and about one-third as wide, is intended to serve as the grand hall or court of entrance to the Exposition both for those who come by rail and by water, and it is a magnificent architectural conception, and even now presents an imposing spectacle. The cornices on the great buildings which form its northern and southern boundaries are uniformly sixty feet high, while toward the lake a double colonnade, or peristyle, of the same height as the buildings, will carry on the cornice line, and give the whole an impressive unity. Toward the landward end of the Plaza the Administration Building, which is the loftiest and most strictly monumental building upon the grounds, rises from a base 260 feet square, and is crowned by a dome which reaches a height of 270 feet above the pavement. The four-story pavilions at the corners of this majestic structure are carried to the same height as the faces of the other buildings, making the cornice line sixty feet high continuous about the Plaza. Visitors who come by rail would pass through the arches of this stately structure into the quadrangle, where their first impressions of the Exhibition will be received. A glance at the map will explain to some extent this arrangement, and the magnitude of the scale upon which the whole idea is worked out will be understood when it is remembered that the basin contains nearly nine acres of water.

This plan of ushering visitors into the grounds through a porch of such dignity and into a court surrounded by architectural splendors, instead of letting them in through some side-entrance, so to speak, seems to us one of the finest inspirations of the design. No group of buildings approaching these in magnitude or of equal ambition in design, and related to each other so intimately, has ever been constructed in the entire history of architecture, and while the designers of the separate buildings have been allowed certain liberties as to details of expression they have worked together in perfect sympathy to secure a single consistent and harmonious effect. Of course there is little opportunity for anything like gardening in this Plaza. The ground on either side of the basin rises in successive walled terraces to the steps which descend from the colonnaded fronts of the building. The promenades are of sufficient width to accommodate the throngs of visitors who are expected, but there are some stretches of greensward in which are four sunken panels to be decorated by large specimen plants or statuary, and there will be space for shrubbery and flowers upon the lower terraces and against the walls. There are ample ways for communication between this Plaza and the buildings on either side

of it, and means of transportation to distant parts of the ground. To those who choose to go by water, a view from the boats in the basin of the buildings above, crowned with spirited groups of statuary and countless flags and banners bearing appropriate devices and in harmonious colors, will be particularly striking. At night the Plaza will be illuminated by search-lights from the square campanile on the lake-side, and all the walls will be treated with rows of incandescent lights along the cornices as well as the upright lines of the building and the ribs of the aspiring dome of the Administration Building. Lines of the same lights will also be arranged along the edges of the terraces and under the coping of the basin-walls, so that the entire plan will be outlined and present a scene of unexampled brilliancy, showing to advantage not only the general architectural features which we have mentioned but illuminating also the great statue of the Republic and the colossal works of allegorical sculpture which, with fountains and rostral columns in harmony with the classic character of the architecture, are massed here in lavish abundance.

In contrast with the elaborate and ceremonial treatment of this Plaza, the grounds to the north of the Buildings of Electricity and Mines open out to embrace the lagoon, which is an irregular waterway flowing about a large island, or rather a cluster of islands. The primary purpose of this island is to add a touch of breadth and natural openness to the scene and give a sense of some informality and repose in the midst of the prevailing activity and bustle. The larger island was originally high enough above the water to support some moderate-sized trees, and others have been planted to make a mass of foliage, over and through which the buildings surrounding the lagoon appear to great advantage. To secure the highest effect it was absolutely necessary that this island should be green to the water's edge, and as the time for preparation is so brief it was necessary that the planting should be made on an absolutely different method from that which would be employed in a permanent work—that is, plants were used primarily for their quickness of growth, and they were set as thickly as they could stand. Immense numbers of Willow-cuttings and shrubs of rapid development have been planted on the banks; and on the immediate edge of the island, where the natural rise and fall of the lake would leave a raw line under ordinary circumstances, plants like Rushes and Sedges and Flags and others which grow even when their roots are under water, have been selected. Great quantities of herbaceous material have been cut in sods from the edges of natural lakes near the city, and brought by the car-load to serve this purpose, and already they are beginning to produce their effect, while in the little coves and bays the Water-lilies are now spreading their foliage and opening their flowers, so that there is little doubt that the ideal of the designers will be realized next year.

That part of the grounds north of the lagoon will be occupied by the reservations for buildings of the various states and of foreign nations, and for our present purpose will need no explanation beyond what the map affords. Indeed, we have only attempted an outline sketch of the general features and leading motive of the design. Very little, indeed, can be said of the horticultural work now while the grounds are being graded and excavations made in preparation for the elaborate system of sewers, water-supply, electric wires and compressed air, not to speak of the necessary foundation for roads and walks. These constructions are of the first importance, and the surface is covered not only with material, but with engines and temporary constructions for the contractors. As the work progresses it is our purpose to give attention to its special features and illustrate from time to time the progress and completion of any of the work as it may prove interesting or instructive to our readers. Some of the more striking incidents of the design will not escape the attention of those who give any study to the plan, and without such a study the im-

portance of this artificial water-system will hardly be appreciated. It will be seen that every one of the prominent buildings is provided with a water-front, so that visitors can be carried in omnibus-boats propelled by electricity from any one to all the other great buildings in the grounds. Some views of conspicuous interest can also be readily imagined from a glance at the map. For example, from the southern end of the canal between the buildings devoted to machinery and agriculture, where there is a colonnade and obelisk, there is a direct line of water for a mile northward to the Art Gallery, and from the bridge near the Illinois State Building the view southward over the waterway and between shores clothed with verdure will be singularly attractive. A similar view can be had either to the north or to the south over the western branch of the lagoon. From the same bridge just referred to the view across the water to the Art Gallery, which, of all the buildings, is perhaps the one nearest perfection in its classic proportions, will be a favorite one. Looking from the island southward between the Buildings of Mines and Electricity the lofty Administration Building will appear to singular advantage; and the presence of the lake, even where it cannot be seen, is always felt as an element of unailing interest. The crowds who pass through the Administration Building when they enter the grand court will catch a glimpse of the lake between the columns of the peristyle and through the triumphal arch in the centre of this great colonnade. But the view of the lake will perhaps be enjoyed most generally from the eastern front of the main building, especially in the afternoon, when this will be in shadow. Ample space for promenade and seats for those who wish to rest, with covered booths and refreshment-tables, will be provided here and thousands can enjoy the coolness and beauty of the outlook.

A Rural Cemetery.

IN contrast to the formal grounds and showy gardening with stiff beds of foliage-plants and gaudy blossoms, which disfigure many well-known cemeteries, the restful spirit that characterizes Walnut Hills Cemetery, in Brookline, Massachusetts, is most grateful. Under the management of careful trustees, the arrangement of trees and shrubbery has been made to assume as natural an appearance as is possible in such a spot. The drives wind under the Oaks and Walnuts and Maples in soft and pleasing curves, while the shrubbery and undergrowth simulate the natural product of such sequestered woody places.

Nothing glaring or incongruous distresses the eye. The tomb-stones are modest and unpretending, many of them of slate or sandstone or granite, which harmonize agreeably with the natural features of the scene, and sometimes a name engraved upon a boulder is the only monument of the sleeper in the smooth grassy space below. There are no divisions between the different lots, no raised mounds to indicate the grave. The turf is closely clipped and green, the wild shrubbery clusters round it, the birds sing overhead, and the effect is sweet and solemnizing, as it should be in man's last resting-place.

The trustees control all the planting; this influence, though it may appear arbitrary to some, and I have been told is often unpopular among those who do not fully grasp the underlying idea, produces a result which could never be attained but by some intelligent governing taste, which subordinates detail properly to the general effect and prevents that shock to the eye which is so frequently felt when a mistaken zeal introduces some feature, good in itself, which conflicts with the main scheme. No planting is permitted here without the previous approval of the trustees, and the design of the tomb-stones must also be submitted to their wise and severe taste before being placed in the grounds. To those who have no especial design to offer, carefully prepared drawings are submitted of various unpretentious stones from which they may make a selection. Some of these designs have been illustrated already in these pages (vol. iii., p. 193), and are of quaint and pleasing pattern, after old Celtic or Norman ideas.

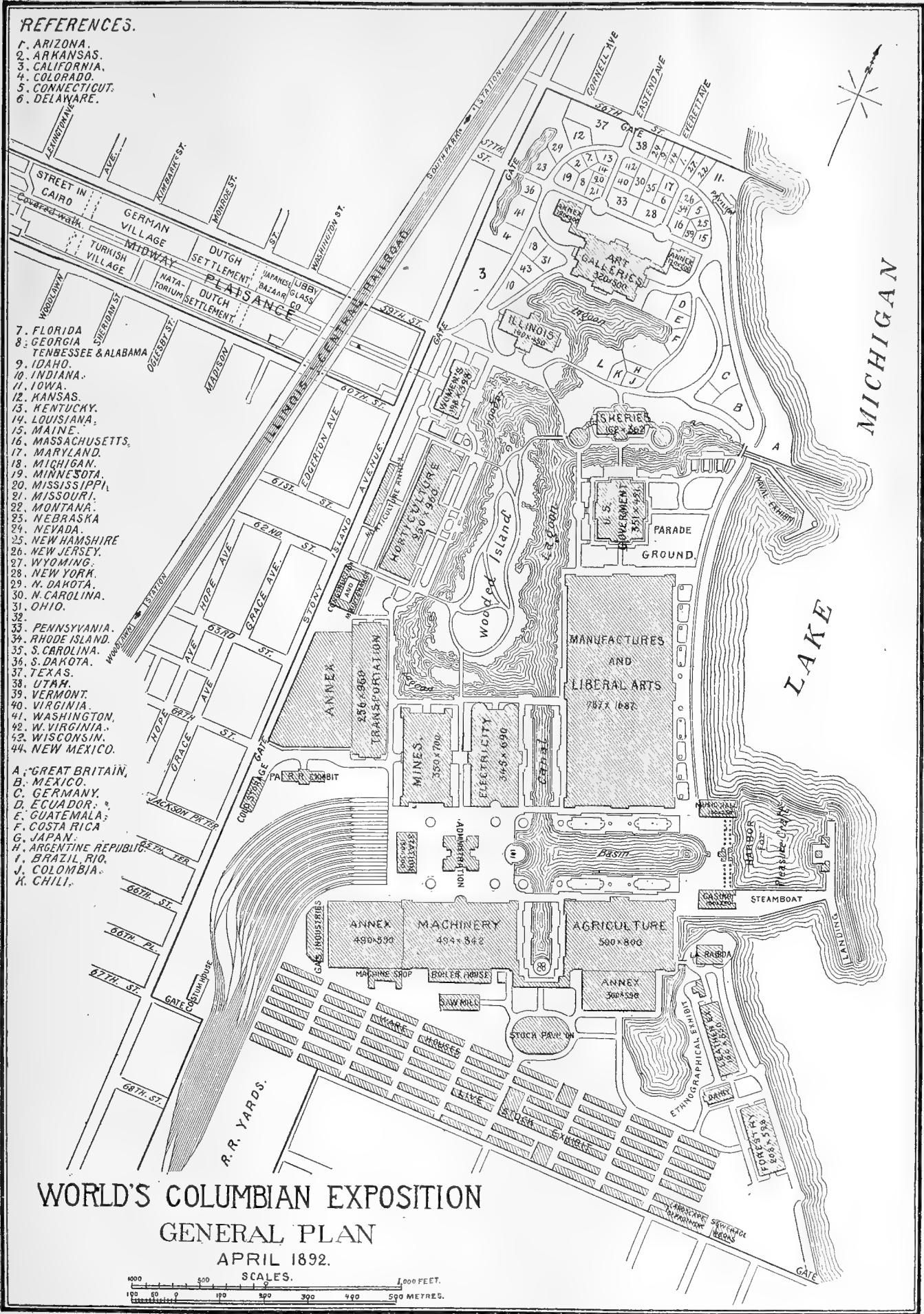
The effect of a simple slab, or of a Norman or Gothic cross, is very grateful to the eye, while a stiff obelisk violates one's sense of the beautiful and destroys the effect of repose, which

REFERENCES.

- 1. ARIZONA.
- 2. ARKANSAS.
- 3. CALIFORNIA.
- 4. COLORADO.
- 5. CONNECTICUT.
- 6. DELAWARE.

- 7. FLORIDA
- 8. GEORGIA
- 9. TENNESSEE & ALABAMA
- 10. IDAHO.
- 11. INDIANA.
- 12. IOWA.
- 13. KANSAS.
- 14. KENTUCKY.
- 15. LOUISIANA.
- 16. MASSACHUSETTS.
- 17. MARYLAND.
- 18. MICHIGAN.
- 19. MINNESOTA.
- 20. MISSISSIPPI.
- 21. MISSOURI.
- 22. MONTANA.
- 23. NEBRASKA
- 24. NEVADA.
- 25. NEW HAMPSHIRE
- 26. NEW JERSEY.
- 27. WYOMING.
- 28. NEW YORK.
- 29. N. DAKOTA.
- 30. N. CAROLINA.
- 31. OHIO.
- 32.
- 33. PENNSYLVANIA.
- 34. RHODE ISLAND.
- 35. S. CAROLINA.
- 36. S. DAKOTA.
- 37. TEXAS.
- 38. UTAH.
- 39. VERMONT.
- 40. VIRGINIA.
- 41. WASHINGTON.
- 42. W. VIRGINIA.
- 43. WISCONSIN.
- 44. NEW MEXICO.

- A. GREAT BRITAIN,
- B. MEXICO.
- C. GERMANY.
- D. ECUADOR.
- E. GUATEMALA.
- F. COSTA RICA
- G. JAPAN.
- H. ARGENTINE REPUBLIC.
- I. BRAZIL RIO.
- J. COLOMBIA.
- K. CHILI.



WORLD'S COLUMBIAN EXPOSITION

GENERAL PLAN

APRIL 1892.

SCALES.



is, after all, the impression one would most naturally wish a burial ground to produce. This effect is left on the mind by this beautiful condition, though some of the canons of art have been violated, even here, by a lack of strictness in the rules in the beginning. An air of serenity and rest for the sleepers pervades the quiet spot. Here the mind naturally turns to reflection, and nothing distracts it from those sweet and serious thoughts which best befit the last home of those we love. There is no consciousness of display, no showy cenotaph to inspire curiosity; all is dignified, unpretending and appropriate. In this, as in the Quaker grave-yards, one feels satisfied that nothing is done for show, but reverently, and with a desire that, in this last home, no man shall overtop his fellow with show of monument or brilliant floral adornment of his grave, but that here all shall be equal in the simplicity and dignity of Death.

Hingham, Mass.

M. C. Robbins.

Weeds in Southern New Jersey.

HOW quickly and how completely cultivation transforms the face of a country and brings on an entirely different class of plants or weeds from those which for ages upon ages had occupied their places before man came with his implements of husbandry to scarify the ground, has been strikingly shown in the recent history of this part of the country. It is only about thirty years ago since clearings were first made in the dense forests here, and for the past twenty-four years I have lived here and watched with interest the changes wrought in the flora. The native flora of southern New Jersey is most beautiful and varied. Some rare and local plants are found here, like *Helonias bullata* and our charming *Pyxidantha*, and it was thought for a long time that our little Fern, *Schizæa pusilla*, was found nowhere else in the world. The *Xerophyllum*, too, is partial to the damp sandy barrens, as well as many beautiful Orchids, among which are *Pogonia divaricata* and *P. verticillata*, with *Arethusa bulbosa* and the yellow-fringed Orchis, and the white-fringed and the pale yellow-fringed *Habenarias* and others. In common with New England and other sections, we find the *Trailing Arbutus*, the *Wind Anemone*, and the little *Star-flower*, the *Partridge-vine* and the *Pitcher-plant*, with others, all shy and retiring in their habits, never making any effort to hold the ground a single season after the plow and harrow have lacerated it.

But there are other plants which do not yield their places so readily, notably members of the Pulse family, like some of the *Desmodiums* and *Lespedezas*, the *Wild Indigo* (*Baptisia tinctoria*), the *Lupine* (*Lupinus perennis*), *Tephrosia Virginiana*, *Cassia Chamæcrista* and *C. nictitans*. Most of these are quite tenacious, and disappear only after several years of fighting against fate. The Composite family also contains a number of handsome plants, which cling to their old haunts persistently. *Asters* and *Golden-rods*, with *Chrysopsis Mariana* and *Diplopappus linariifolius*, are still found on the road-sides, and often in vineyards and orchards. Two Milk-weeds are common, *Asclepias tuberosa* and *A. obtusifolia*, the roots of which seem to be below the reach of an ordinary plow. For this reason great clumps of *A. tuberosa*, with its bright orange flowers, are often seen in vineyards and orchards which have been tilled for years.

But these native plants are, after all, only scattering individuals compared with the hordes of foreign weeds which follow man wherever he goes and begins to interfere with the native flora. Was ever a garden free from Purslane, even though planted in virgin soil? And the Pig-weed (*Chenopodium album*) soon follows, as well as the hateful *Amaranths* and *Shepherd's-purse* and the common prostrate *Mallows*. That most miserable of all pests, *Butter and Eggs* (*Linaria vulgaris*), came here among the earliest of the weeds. Some of the *Polygonums*, too, quickly gain a foothold, like the spreading *Door-weed* or *Knot-grass*, and the *Lady's-thumb* and the climbing *Bind-weed*. Others are later in making their appearance in our sandy soil. It was several years after the ground was cultivated before *Dandelions* were common. We had some difficulty at first in making them grow at all, but now they are everywhere on the road-sides, and they star every lawn with their bright flowers. For several years past I have made greater effort to grow *Catnip* than almost any other plant in my collection. I have several times planted seed, and have had strong roots sent from the north, but they soon disappear in spite of all my pains. The cats of the neighborhood are the cause of my failure. They are sure to break through any protection I can rear and gnaw the plants even below the surface of the soil. But the *Ground Ivy*, a near relative of the *Catnip*, has come to stay, for the cats let this alone.

For some fifteen or twenty years I never saw a *Mullein*

here, but now they are invading our ground in considerable numbers. I have not yet seen the *Burdock* nor the *Canada Thistle*, nor the *Hound's-tongue*, nor the *Beggar's-lice*—all vile weeds so common in waste-places and pastures of the north. Two species of *Buttercup* are just gaining a foothold, *Ranunculus acris* and *R. bulbosus*.

The common *Morning-glory* (*Ipomœa purpurea*) is a great pest in some vineyards and orchards, but how handsome the flowers are in the morning in their varying shades of color, from the deepest darkest purple and bright rose, with white throats, and beautiful shades of pink up to pure white. But the *Japan Honeysuckle* is worse than the *Morning-glory*. The soil suits it, and it runs rampant everywhere. It has escaped from cultivation, and is becoming at home along the country roads and in the edge of woodlands. It is an evergreen with us, and when kept within bounds is very desirable; but let the man who plants it buy a grubbing-hoe at the same time. The night-flowering *Catchfly* (*Silene noctiflora*) is another pretty weed that is becoming altogether too common in our cultivated grounds. The *Ox-eye Daisy* and *Mayweed* and *Yarrow* abound, of course, and were among the earliest of the weeds to reach us.

But one of the most remarkable of these foreign weeds is *Galium Mollugo*. It is only some twenty-five or twenty-six years since it was first observed growing spontaneously near New York City. It is a graceful, pretty plant, and, unlike our native *Galiums*, the stem is perfectly smooth. The small white flowers are in long panicles and quite fragrant. The leaves are mostly in whorls of eight; sometimes, when very thrifty, we find ten and twelve in a whorl. The sandy soil seems to suit it, and it grows most luxuriantly. I think, however, it will not prove very troublesome except in meadows and grass-lands. It flowers in May, when we sometimes see a meadow perfectly white with it, as if it had been planted for a special crop. It is also on the road-sides and along the railroad-tracks. Strangely enough, I am surrounded with it as I write, for it decorates my study-walls. Some designer of wall-paper has seized upon its graceful form and traced a pretty running pattern of this plant alone over a delicate buff ground. Unlike most designs of the kind, this one is very true to nature.

Vineland, N. J.

Mary Treat.

Mid-June in West Virginia.

JUNE is as much the *Honeysuckle* month as the month of *Roses*. The two bloom together in the poet's heart and should not be divided in the garden. If we had no other flowers in June this month would still be preëminent in delight-someness. Throughout the rest of the summer we shall have them with us, but not in their present lavish beauty. After the June blooming both *Roses* and the monthly *Honeysuckles* "bide a wee" to gather strength for a second effort.

As the *Roses* fade the golden-hearted *Lilies* open in the garden-borders and through the grass, while the *Hollyhocks*, in sturdy groups, stand ready to keep up the succession of showy bloom. This is the day of the late *Deutzias*. The double variety of *D. crenata* is now in full beauty; a graceful shrub six feet in height, blooming well on the upper branches, but more sparsely below. These shrubs are charming for grouping with deep red hybrid *Remontant Roses*, such as the *Giant of Battles*, *General Jacqueminot* and the *Baron de Bonstetten*. There is just now little bloom in the shrubberies. The *Purple Fringe* is preparing its rosy mist or "smoke," that will remain upon the trees for many weeks and form one of the most beautiful ornaments of the midsummer garden. These trees, or large shrubs, bloom when three feet in height, but are not in full beauty until they are about ten years old. They are apt to grow ill-shaped and straggling unless properly pruned when small.

Cotoneasters have now small inconspicuous flowers which are white and pink, and are eagerly sought by wasps and ants for the honey they secrete. The mature blossoms look like very small *Apple-buds*. They never expand fully, but have a little opening in the centre of each flower just large enough to permit the rifling of the honey within. *Itea Virginica* is very pretty now, with its numerous short racemes of tiny white flowers studding the bush and contrasting effectively with its light green oblong leaves. This shrub grows rapidly and spreads by many suckers, and is valuable for planting on the margin of large shrubberies. The curious, vase-shaped and coral-colored flowers of *Clematis coccinea* are now ornamenting the vine, which is, with us, of slender growth. It seems quite hardy, and is a pretty companion to a white *Clematis* which shares its trellis. Among the tall and showy *Pæonies* there are some striking varieties which rival the *Roses* in

beauty. Marie Stuart is very double, a fine satiny pink with a delightful perfume. Louis Van Houtte is purplish crimson, double, and effective in a mass of a dozen plants set at a distance of eighteen inches apart.

This is the season of most rapid growth in the vegetable world, and it is a keen pleasure to note how the frequent rains and warm, but not extremely hot, sunshine are bringing on our favorite shrubs and trees. A young tree which has been sent to me as *Cedrela Sinensis*, is making amazing progress, having shot up four feet since the expanding of its terminal bud in May. It looks very much like an *Ailanthus* to my uneducated eyes, but I am told that its large white blossoms are pleasantly fragrant.

One of the most interesting of the small trees in our shrubberies is *Parrotia Persica*. This has fine healthy foliage, which resembles that of the Witch Hazel, but is lighter in color and smaller in the size of leaves. The young growth is a pretty shade of pink. The tree is very ornamental, grows quite rapidly, and the foliage turns in the autumn to a fine dark crimson, lightened and shaded with orange and green. The blossoms come before the leaves, but our specimen has not yet flowered. The Witch Hazel itself, which is a near relative of *Parrotia*, is a very pretty and interesting tree, and is worthy of much more extensive planting than it receives.

Rose Brake, W. Va.

Danske Dandridge.

Foreign Correspondence.

London Letter.

THE Royal Horticultural Society's great annual exhibition at the Temple has now become an important event in London. The progress of the society in popular as well as in professional favor is marked by the increased success of these exhibitions every year. An enormous crowd of people visited the show during the two days; even on the first day, when the price for admission was five shillings, the four large marquees and lawns were thronged with fashionable people, all more or less interested in the plants and in the society. If the Temple Garden is small, it has the great advantage of being central. The fact that the first day of the exhibition was the Queen's birthday, when all the law courts, etc., are closed, no doubt, had something to do with the exceptional number of visitors present on that day. As in previous years, the principal feature of the exhibition this year was the Orchids. Large collections of beautiful, rare, new and well-grown plants were contributed by the leading amateurs and nurserymen who are specially interested in Orchids. But while they were the first attraction, the collections of Ferns, Roses, hardy Azaleas, Begonias, Gloxinias, Clematis, herbaceous and alpine plants, stove foliage plants, etc., were of first-rate quality, such as would have made a grand exhibition had there been no Orchids at all. An enthusiastic and energetic executive, popular favor and glorious weather could scarcely fail in enabling the society to score a big success.

There is a great change in the character of these large plant exhibitions in London from what they used to be. Old stagers bewail the absence of this or that family of plants which once upon a time were favorites with exhibitors. But for my own part I like the modern exhibition, with its large collections of good interesting plants, represented by specimens such as any one can grow, far better than those huge elephant specimens which made everybody exclaim how wonderful, but really taught very little gardening. Here from Mr. May, of Tottenham, and Mr. Birkenhead, of Sale, were large collections of perfect little specimens of Ferns, such as one could carry home with him and keep in his own garden. Mr. Anthony Waterer's beautiful exhibit of hardy Azaleas was of the same character. You can take them and plant them in your border, and if your garden is not a brick-field they will be better yet next year. The same is true of the Orchids and other plants shown, no bedded-out specimens, no stiffly trained, wired, wadded, gummed, pampered-looking monsters, but good business-like plants, such as any gardener, let us hope, could grow.

Of course, there were plenty of novelties; far more, indeed, than I shall be able to mention. I will begin with the Orchids. The most beautiful specimen among these was a plant of *Cœlogyne Dayand*, from the gardens of Baron Schröder. It was in a basket a foot in diameter, and bore twelve pendulous racemes of flowers each a yard long. The Baron's collection was superb, both in interest and good cultivation. Splendidly flowered *Cymbidium Lowianum* (fourteen spikes), *Masdevallia Houtteana*, a large tuft of leaves surrounded by a broad ruff of flowers; *Odontoglossum Hallii*, var. *xanthodon*, *O. excellens* with a twenty-flowered spike, *O. crispum*, var. *apiatum*, a gorgeous variety, *Dendrobium nobile*, var. *nobilius*, *Vanda teres*, *Lælia purpurata*, *Ærides Savageanum*, a deep crimson-flowered variety, and the rare little *Dendrobium-like Hexisea bidentata*, which has numerous clusters of bright scarlet flowers as large as those of *D. Japonicum*. Sir Trevor Lawrence's collection was composed almost entirely of rarities and plants of exceptional interest. Among them were the new Sierra Leone *Polystachya bracteosa*, with broad flattened pseudo-bulbs and drooping scapes of brown and yellow hairy flowers; *Dendrobium lamellatum*, a remarkable little plant, with ancipitous pseudo-bulbs and white and yellow flowers; *Megaclini-ums*; *Masdevallia Mundyana* and *M. hieroglyphica*; *Sarcochilus Fitzgeraldii*; *Bulbophyllum Silemianum*, with yellow flowers, the lip crimson; *Cymbidium tigrinum*, *Cypripedium Philippinense*, *Dendrobium Brymerianum* and many more. Noteworthy among the other collections from amateurs were the following: *Grammatophyllum multiflorum*, with a scape five feet high and forty-six flowers, which suggested *Vanda Lowii*, being green-yellow with deep chestnut blotches. *Lælia majalis*, rarely seen in bloom, was here represented by a healthy plant bearing two magnificent flowers. *Brassias* of various kinds; *Odontoglossum Karwinskii*. *Lælia purpurata* variety, with the whole lip colored deep maroon; *Phalænopsis speciosa*, and many varieties of *Dendrobium Phalænopsis*. The most remarkable specimen Orchids were three huge plants of *D. nobile* from the gardens of Viscountess Postman. Each plant measured five feet in diameter and bore from a hundred to a hundred and fifty pseudo-bulbs all in flower except the immature ones, and each bearing from forty to fifty flowers. It was generally admitted that no such well-grown examples of *Dendrobiums* had ever been seen before.

Among the nurserymen, the collection of Messrs. F. Sander & Co. comprised a great number of beautiful and rare plants. *Cypripedium Chamberlainianum* was represented by eight plants in flower, only two flowers being open on each, the scape measuring about ten inches in length; the green and yellow sepals and petals and the peculiar shade of purple of the large pouch are quite different from any other cultivated *Cypripedium* known to me. A variety called *excellens* differs from the type in having a cream-colored dorsal sepal. *C. Vipani*, a hybrid between *C. niveum* and *C. lævigatum*, is a pretty plant, with white flowers streaked with crimson on the sepals and petals. *C. Exul* was shown under a glass case, a distinction it scarcely merited. *Oncidium Gravesianum*, a new Sanderian species allied to *O. prætextum*, *O. Rolfeanum*; *Cattleya Mossiæ*, var. *Arnoldiana*, white with purple shading on the front lobe of the lip, and yellow and brown-purple in the throat; *C. Schroderæ*, var. *virginalis*; *Odontoglossum excellens*, a beautiful variety; *O. Amesiæ*, a supposed natural hybrid between *O. crispum* and *O. Coradinei*; it has large well-formed flowers, white, with conspicuous blotches of chestnut-brown; *O. crispum*, var. *Wellsianum*, with large white flowers, the blotches of exceptional size, and the segments deeply lacinated; *O. crispum*, var. *Sanderianum*, with flowers as fine as those of Veitch's variety, but with more reddish brown. This is a wonderful plant, and an enormous price had been paid for it—higher than any ever yet paid for a single Orchid. *O. Lowryanum* has olive-brown flowers, with a little green, and a blotch of white on the labellum. *O. Pescatorei*, var. *Schröderæ*,

has creamy white flowers with a blotch of yellow at the base of the lip. *Cattleya Mendelli*, Cookson's variety, has very large flowers, with an exceptionally long, broad labellum and very richly colored. *Epidendrum Randii*, *E. Godseffianum* and a white-lipped variety of *Miltonia vexillaria*, called *Sanderiana*, were also noteworthy. *Masdevallia Measuresiana*, the interesting hybrid, and a still more interesting hybrid, namely, *Miltonia Bleui*, were also among Mr. Sander's many choice things. How comes it that a hybrid between two true *Miltonias*—namely, *M. Roezlii* and *M. vexillaria*—has been elevated to the rank of a new genus, and called *Miltoniopsis*? Mr. Sander had his plant labeled *Odontoglossum Bleui*, var. *splendidissimum*; it had large flowers, white, the petals rose-tinted, with radiating lines of red-brown on the labellum.

Messrs. Shuttleworth, Charlesworth & Co., of Bradford, exhibited many beautiful Orchids, including a grand lot of *Oncidium macranthum*, *Lælia purpurata*, *L. tenebrosa*, *Odontoglossum Wilkeanum nobilis*, a large-flowered variety with broad pale brown blotches and a tinge of yellow on the lip. *Cattleya intermedia alba*, the flowers absolutely white throughout, and a grand specimen of *Oncidium crispum* crowded with flowers. Messrs. B. S. Williams & Son contributed a large collection of well-grown specimens of *Vandas*, *Lælias*, *Miltonias*, *Oncidium concolor*, evergreen *Calanthes* and *Geodorum citrinum*. J. Cypher, of Cheltenham, famous for excellent cultivation of Orchids, sent a fine lot of *Cattleyas*, *Lælias*, *Cypripedium caudatum* and *Epidendrum radicans*, the last-named bearing eight bunches of bright orange-scarlet flowers. Messrs. Hugh Low & Co. sent *Cattleyas*, *Phalænopsis*, *Dendrobium superbum*, *Odontoglossums* and *Lælia grandis tenebrosa*.

The same firm contributed a beautiful group of *Ericas*, small plants well-flowered, their names being *Ventricosa grandiflora*, *V. Bothwelliana*, *V. superba*, *V. globosa alba*, *V. coccinea minor*, *Perspicua nana*, *P. erecta*, *Sindryana*, *candidissima*, *hybrida*, *depressa*. *Pimelia Hendersoni*, a dark-colored variety of *P. decussata*, attracted a good deal of attention, as also did a fine group of *Cytisus scoparius Andreanus*. This beautiful hardy shrub was also well shown by Mr. Anthony Waterer, of Knap Hill, who also sent a collection of his improved varieties of hardy *Azaleas*, including the double-flowered forms. It is scarcely necessary to recommend Mr. Waterer's *Azaleas* even to American horticulturists, as they are now as famous as his *Rhododendrons*. There was one, however, white-flowered, and called Mrs. A. Waterer, which shared with Baron Schröder's *Cœlogyne* the chief honors of the exhibition. Imagine a compact bush with ovate soft green foliage of good substance, and clothed with compact clusters of pure white flowers, with a pale blotch of yellow, the flowers as full as those of a good Indian *Azalea*. As a hardy plant this new seedling has a future of promise, and it looks very likely for forcing. Messrs. Laing's *Begonias* were magnificent, but they were not far in front of those sent by Mr. Cannell and Messrs. T. Ware & Son.

Messrs. J. Veitch & Sons had a large group of seedling *Streptocarpus*, another of *Gloxinias*, and another of the beautiful hybrid *Disa Veitchii*. In the largest tent the group of hardy plants from the same establishment was worthy of its reputation. It consisted chiefly of hardy *Azaleas*, *Hydrangeas*, *André's Genista*, *Spiræa astilboides*, *Azalæa amœna splendens*, a great improvement upon the type; *Cytisus scoparius pendula*, grafted on stems four feet high, and forming pretty little weeping specimens; *Ribes pumilum aureum*, a dwarf plant scarcely three inches high. Mr. William Paul's *Roses* were as fine as ever; so, too, were Turner's specimen *Pelargoniums*, and R. Smith & Sons' *Clematis*. A *Carnation* called *Almira*, from the gardens of Leopold de Rothschild, was worth special notice. It grows to a yard in height, and has large pale sulphur-yellow flowers with streaks of red.

Messrs. J. Backhouse & Sons, of York, sent a choice collection of hardy alpinæ, arranged in flat boxes with sand-

stone, so as to represent a miniature rockery. This exhibit was greatly admired.

Messrs. Linden, of L'Horticulture Internationale, Brussels, sent a collection of new stove foliage-plants, beautiful in themselves and beautifully grown. The beautiful yellow-flowered *Calla Elliottiana* was shown by its lucky possessor, who, we were told, had refused an offer of £500 for it. There is no doubt about its great beauty, flowers as large as those of the common white *Calla*, colored a rich citron-yellow, the leaves spotted with white. I am told that other people have, or soon hope to have, newly imported plants of this *Calla*. It is certain to become a general favorite. Mr. Rivers, of Sawbridgeworth, sent a grand collection of fruit-trees in pots, and bearing a good crop of ripe fruits.

London.

W. Watson.

New or Little-known Plants.

Cape Ivy (*Senecio macroglossus*).

THIS is a pretty yellow-flowered greenhouse-climber which deserves to be generally grown. It is rarely out of bloom at Kew, where it is trained against a rafter in the cool end of a large house devoted exclusively to succulent plants, a position which probably it has occupied for at least twenty years. Its shoots and leaves are very similar to common Ivy; indeed, I have been told that it narrowly escaped being destroyed for Ivy when it was first introduced. Planted in a well-drained border and not overwatered, it grows rapidly, draping in a year or so a rafter ten feet long with its elegant shoots. These are especially floriferous in winter and spring, the bright canary-yellow flowers almost sparkling in the sunshine. They are useful for cutting, lasting a week or so in water. Each head has usually eight ray-florets, with broad, elliptic spreading limbs, toothed at the apex. The disc-florets are also yellow. Sir Joseph Hooker says this is the largest-flowered species of the enormous genus to which it belongs, and which contains nearly one thousand species. It is a native of south Africa, from Algoa Bay to Natal, whence it appears to have been sent to Kew by Mr. Sanderson in 1868. It ripens seeds under cultivation, and it is easily multiplied from cuttings. In some parts of Italy and southern France *S. macroglossus* is not uncommon as a climber on verandas, and upon trees in the open air.

The German Ivy (*S. mikanioides*), which has thinner and larger leaves with smaller flowers, is grown as a window-plant in some parts of Germany.

London.

W. Watson.

Cultural Department.

Notes on Shrubs.

LABURNUMS have this season produced a fine display of blossom in the vicinity of Boston. Like many other plants, they appear to have "off" years, when comparatively few blossoms are produced. I once had the impression that *Laburnums* should not be considered very hardy here, but after seeing their size and habit of growth in places near their native home, there seems good reason to believe that they ought to thrive here almost as well as they do there. In the vicinity of Boston and near the sea-coast there are specimens of *Laburnum vulgare* as strong, well-branched and shapely as could be desired. Yet the *Laburnum* is comparatively rare here, and this is probably due to several causes. It does not thrive if the situation is too wet, and in such places the stems are liable to be killed in winter. It will be found to do best in well-drained soil or on a comparatively dry bank. It is not a long-lived tree, its branches are easily broken, it seems liable to attack by borers, and destructive fungi soon get a foothold if the stem sustains any serious mechanical injury which tears the bark and exposes the wood. The *Laburnum* will grow and thrive fairly well in the partial shade of other larger trees or on the borders or edges of woods. In such situations it, of course, grows somewhat tall and spindling in habit, but grown as a single specimen, with plenty of light and air, it should become a compact, rounded little tree.

It is not commonly known that there are two species of *Laburnum* grown in gardens, and of these there are a number of

named varieties which have been selected and propagated by gardeners in the course of many years of cultivation. An examination of a large number of plants growing in various places in this region shows that with very rare exceptions they all belong to the so-called common Laburnum (*L. vulgare*), the species known as the Scotch Laburnum (*L. alpinum*) being very uncommon. The latter has smaller flowers of a deeper yellow color than those of *L. vulgare*; the standard usually has very faint marks or lines near the base on the inner side, and its lateral edges are often quite strongly reflexed. The flower-buds before opening are more flattened laterally. The leaves are glabrous on both surfaces, pale green beneath, and usually



Fig. 53.—*Senecio macroglossus*.—See page 294.

wider in proportion to the length, and the branchlets are smooth and shining.

In the common Laburnum the flowers are larger and lighter yellow-colored than those of the Scotch, the inner central lower portion of the standard is distinctly marked by dark red lines, and the lateral edges are not nearly so much reflexed. The flower-buds do not appear so much compressed laterally. The leaves are glabrous above, but grayish beneath on account of being covered by a minute closely appressed pubescence, and they are usually less than half as broad as long. The branchlets and winter-buds are grayish from being covered by a minute close pubescence. There is also a very marked difference in the fruit, the pods of the common Laburnum being thick-shelled and stout, while those of the

Scotch are thin and flat, the upper edge being prolonged, thin and knife-like. The seeds of both are said to be poisonous.

There are various forms of *L. vulgare*, of garden origin, which are often recommended as possessing qualities superior to the type. Of these probably the best variations are those known as Waterer's and Parkes'. There are also forms with abnormal foliage, such as yellow-leaved, curled-leaved, and with foliage so cut as to suggest diminutive Oak-leaves, but none of these are worth growing here except as curiosities or monstrosities.

A Laburnum both curious and interesting is that known as Laburnum Adami, famous as having been the result of a graft hybrid between the common Laburnum and *Cytisus purpureus*, a hardy dwarf, shrubby plant of the same family, bearing a profusion of purplish flowers at about the same season as Laburnum. This graft hybrid plant assumes the habit and stature of Laburnum, but its flowers may be purplish or like those of the typical Laburnum or those of *Cytisus*, and the foliage of either parent may appear in distinct branches and branchlets of the same tree, thus presenting a curious contrast.

Cytisus purpureus is well worth growing for its show of handsome purple bloom in the latter part of May and early June. It is a low, procumbent, spreading, slender-twigged shrub, scarcely rising over a foot above the ground, and on account of its inconspicuous habit European gardeners often graft it on tall stems of the Laburnum. But to many minds such treatment of it seems too artificial and out of harmony with the character of its foliage and blossom, and, besides, the plants do not thrive so well here, and are certainly not so sure of long life as when on their own roots.

C. nigricans, a later-flowering dwarf species, with slender spikes of bright yellow flowers, and several other kinds are often subjected to the same treatment of high grafting, but although they are rendered more conspicuous they are no more pleasant to look at than when growing in the natural way.

Arnold Arboretum.

J. G. Jack.

The Wild Garden.

THE sunny side of a large, abrupt mound, beside a pool of water, was absolutely covered with the beautiful flowers of *Phlox subulata*, the Moss Pink, during the month of May. It was a charming sight, and one that afforded a good illustration of the best place for this useful plant. The flowers are now almost past, except on the north side of the mound, where the plant is still very gay and makes an excellent associate for the fair Lily-of-the-valley. The reddish purple flowers of *Phlox procumbens* are also very showy, but this plant prefers a cooler situation.

Antennaria plantaginifolia, the Plantain-leaved Everlasting, covers a neighboring mound with its hoary foliage, and numerous aquatic plants luxuriate in the water beneath. A little tuft of Bluets occupies a quaint position on the root-stump of an Azalea by the watery margin, and Marsh Marigolds are still a beautiful spectacle of orange-yellow flowers and verdant foliage in the rich mud adjoining. The pretty racemes of the Buckbean, *Menyanthes trifoliata*, peep above the shallow water a little further along, and the yellow Pond Lily is showing its large, golden balls in the deepest places. On an adjacent, shady bank, *Geranium maculatum* thrives beautifully, and its pale, purple flowers are prettier than those of many a more costly plant.

Ferns and *Aquilegia Canadensis* make a most effective combination among the rocks and earth, forming an irregular mass, the rich red and yellow flowers of the Columbine having an exquisite setting in the varied shades produced by the Fernfronds. The white flowers of *Anemone Pennsylvanica* have unfolded. The plant is a robust grower and blooms freely. It thrives best in a dry, open position. The flowers are two inches in diameter, with a pretty cluster of yellow stamens in the centre, and they are produced most abundantly where the plants receive the greatest amount of sunshine. *Clematis ochroleuca* is interesting on account of its rarity. It is about two feet high, and blooms freely in the sun. The urn-shaped flowers are purplish outside, creamy within, and they are borne singly at the top of the stems.

The Wild Hyacinth, *Camassia (Scilla) Fraseri*, is strikingly handsome. It has long, linear leaves and scapes more than two feet high. The flowers are pale blue, an inch across, on pedicels an inch long, and arranged closely on the upper portion of the scape, covering about a foot of its length. Unlike *C. esculenta*, it is perfectly hardy in this latitude, and it flowers freely during May and June. It needs a deep rich soil, and plenty of light is beneficial, though the flowers fade rapidly if they are not sheltered somewhat from the sun. This is undoubtedly

one of the best native bulbous plants for garden cultivation, and one that should be in every collection, however small.

The Mossy Stone Crop, *Sedum acre*, is ablaze with its golden flowers, and it is one of the most useful things for those dry or rocky situations in which dwarf plants are required. It makes a delightful natural edging for a portion of the wild garden, and it would be no less effective or desirable for similar purposes in gardens of greater pretensions. Moneywort, *Lysimachia nummularia*, and the Field Chickweed, *Cerastium arvense*, are useful in the same way. The former is not yet in bloom, but its thick carpet of fresh green leaves is worth a great deal, and the little yellow blossoms will appear in due season a few weeks hence. *Cerastium arvense* is also close and compact in growth, and its leaves are small and pointed. It is in full bloom now, a mass of snowy whiteness.

Rich groups of color are supplied by *Thaspium aureum*, *Amsonia Taberæmontana* and *Baptisia australis*, the Blue False Indigo. These plants are from three to four feet high, and require good deep soil and full exposure to sunshine. They are most effective in large masses, but make beautiful and shapely clumps of a size suitable for mixed borders. They all bloom freely. The flowers are small in the *Thaspium*, of orange-yellow color, and are borne in dense umbels from two to three inches across. In *Amsonia* they are of a light blue color, an inch across, and produced in large terminal panicles. The *Baptisia* has large Pea-shaped flowers, of pale blue color, in long, erect racemes.

Erigeron bellidifolius forms a thick, dwarf undergrowth, and sends up straight, sparsely leaved stems to a height of eighteen inches, each bearing from six to eight Daisy-like flowers, an inch and a half in diameter, with yellow disk and lilac ray florets. It is an admirable plant for a sunny situation. *E. flagellare* is a pretty dwarf species of creeping habit. The stems do not exceed six inches in height, and the whitish flowers are somewhat smaller than those of *E. bellidifolius*. The compact clusters of *Thermopsis mollis*, about two feet high, have a pleasing effect. The long terminal racemes of clear yellow papilionaceous flowers are very showy and useful at this time. Its taller-growing relative, *T. Caroliniana*, blooms a month later. Both plants flower freely, and grow well in ordinary garden-soil.

One of the best wild flowers for shady places is the False Spikenard, *Smilacina racemosa*. It is about four feet high, and the simple stems are furnished with large green leaves. The flowers are cream-colored, fragrant and small, but they are produced in immense terminal racemes. *Polygonatum giganteum*, the Great Solomon's Seal, also grows luxuriantly and flowers abundantly under trees, and so does *Arisæma triphyllum*. The spathes of the latter plant, however, develop their pretty colors much better under the influence of winter.

Cambridge, Mass.

M. Barker.

Flower Notes.

IT is a good time, as the flowers of certain plants pass away, to destroy those which for any reason are not desirable. By prompt action of this kind, while the dissatisfaction still lingers, one parts with the plants without regret, and the general effect of the garden is improved. We are apt to delay this often important weeding-out so that undesirable plants are grown year after year. To a special collector any variety of a given family of plants may prove interesting, but to others there is no family in which the average grower will not find some practically worthless members. The grower who simply cares for attractive plants will discard those which have a merely botanical interest, which are unsuitable for available positions, or whose form or color is displeasing.

It is interesting to study any family of plants and separate them into classes. As a practical example take the Columbines, which happen to be plants, some of which are still in bloom. Looking over a collection of them in flower the most striking difference will be found in the varieties considered as effective or showy garden-plants. It is no fanciful division to separate them into three sections, of which the long-spurred, bright-colored ones, like *Aquilegia chrysantha*, *A. cœrulea* and *A. truncata*, may be considered the vivacious members. Varieties of *A. glandulosa*, *A. grandiflora alba*, *A. Pyrenaica* are quiet and reposeful, while many of the short-spurred, dull-colored kinds are vapid and spiritless in effect. It is curious to note that the vivacity of a flower depends more on the combination of form with color than on color alone. This may be seen by comparing flowers of the same color, but with dissimilar forms. As a bright, effective, vivacious flower *A. chrysantha* is not surpassed by anything in the garden, a golden flower, poised delicately in air as if in flight upward.

The due consideration of the different effect of these plants will cause them to be placed by the careful gardener in positions where these qualities may be most effective. Most of the Columbines are plants for the less conspicuous parts of the garden, but if planted in prominent places such kinds as *Munstead White*, for instance, are more suitable than *A. Canadensis*, not because this is not equally beautiful, but because we naturally associate our favorite wild Columbine with woods and rocks and informality.

The various notes on *Narcissi* also remind me that in this family also may be found varieties which are not effective as garden-plants, though I know of no variety which may be considered altogether vapid. The most surprising thing, considering the vast numbers of *Narcissi* now in cultivation, is that the varieties are really distinct, though often slightly so. The distinctions are often only clearly seen, however, when the plants are grown in masses. There is, no doubt, often much disappointment felt on the first view of many Daffodils, and especially over the pallid kinds, the pale yellows, the pale sulphur and alleged creamy whites. Even in masses these cannot be considered effective garden-flowers, but they are valuable under artificial light and make excellent flowers for the house. Of course, such useful plants can be grown in inconspicuous positions. On the whole, yellow flowers are the most attractive of any color for the garden, but there is a vast variety and choice in yellow. The tones seem infinite, and probably indescribable without examples for illustration. The largest number of Daffodils are yellow, and the principal dealer's list uses a score of designations, from pale primrose to deep golden, in the endeavor to describe the different tints. Considering that the tones vary somewhat with the different seasons and the soil of different gardens these fine distinctions are not very helpful. If the beginner asks for help in all this confusion of names and tones, probably the best advice would be to commence mostly with the large trumpets, avoiding the pale primrose and light straw-colored sorts on the one hand, and the very deep yellow ones on the other, as described in a reliable list.

Elizabeth, N. J.

J. N. Gerard.

Hardy Plant Notes.

THE hardy perennial borders are now in their best condition, since the season, though late, has been favorable for all plants of this description, and none have been injured by late frosts, as is often the case. The Oriental Poppies are now in their glory, and force all other flowers in the background with their strong color. The true *Papaver bracteatum*, though considered a form of *P. orientale*, is by far the best Poppy grown as to color. Carefully selected seeds of *P. bracteatum* will not come true, but will revert to the common *P. orientale*, so that it is necessary to propagate it from root-cuttings. Pieces of root an inch long are a suitable size. If taken when the plants die down soon after midsummer, these should be dibbled into sand to start them and may be planted out in fall or wintered over in a cold frame, and they should flower the next season. A variety obtained in seed as *P. bracteatum præcox* is no earlier and differs in no way from the common *P. orientale*, though we had hoped better of it. The variety sent out some time ago as *P. Parkmanni* does not seem to be any different from an ordinary Oriental Poppy, though distributed at a high price and with a great flourish. It is well to remark that Oriental Poppies vary more than is supposed from seed, and it is difficult to find any two that are exactly alike, both in color and in the markings at the base of the petals.

Lindelofia spectabilis præcox, we are told, is often sold in Europe for *Mertensia Virginica*, our beautiful native Lungwort, though it is difficult to understand why, as the plant has nothing in common with *Mertensia* except that it belongs to the same order, *Boraginaceæ*. The *Lindelofia* is perfectly hardy, though a native of Kashmir, and bears a quantity of bright blue flowers for several weeks at this season. Seeds are very slow to germinate, often taking several months, and they always come unevenly. This is a monotypic genus, and the flowers of *L. spectabilis* are said to be purple-red, a very different combination from that of our plants, which are of a real Gentian blue. Flowers of a different color, even on the same stem, are common in this family, as in the *Borage*, *Mertensia*, and in a plant now in bloom called *Caccinia strigosa*. This plant is a native of Afghanistan, and has wintered out safely; its chief beauty, however, lies in its foliage, which is of a decided glaucous or grayish color, and at once arrests attention in a border of mixed plants. In this plant different flowers are both pink and blue at the same time. Our plant is

not strong, but in time may improve and gain vigor, since it is now flowering for the first time from seed.

Iris Troyana belongs to the rhizomatous section of Iris, with such varieties as the German Iris, and is quite distinct in color from most of these, though of the same habit and time of flowering. I cannot find any account of the species published, and am at a loss to know more of the plant, as it is hardy, and is in bloom in eighteen months from seed, quite an unusual occurrence for an Iris.

I wrote of *Lathyrus tuberosus* last year as a very pretty hardy tuberous-rooted Pea, all of which is true, and it is equally true that this Pea, like *Apios tuberosa*, has the remarkable ability for coming up in all places but the one in which it is planted. Though the plant is exceedingly pretty when in bloom, it is not fit for a flower-border, as it spreads too rapidly and takes hold of other plants and chokes out. But if planted where it could be left to its own way of growing, as in a wild-garden, it would be a thing of beauty many weeks.

Adlumia cirrhosa, or Climbing Fumitory, is a graceful twining plant in the second year of its growing, with small inconspicuous flowers of very little value, but we find the plant of much use when raised in spring and planted out where it will quickly form a dense mass of most elegantly cut leaves, which makes a good substitute for Maiden Hair Fern with cut flowers, and lasts much longer. We used these leaves all last summer, and saved the Fern for winter use. The second year the *Adlumia* loses all its tufted habit and throws up tall stems that need support, as it is a true climber. Unlike most of this family, the *Adlumia* is readily obtained from seed sown early in spring. Another of the Fumitory family recently noted in these pages is *Corydalis nobilis*, a truly noble border-plant when well grown, but very seldom seen in gardens. It needs to be left alone when once planted, as the roots have the appearance of being half-decayed. These are easily obtained in fall from Holland with the Dutch bulbs. *C. nobilis* is the finest of the genus, and well deserves to be much better known.

South Lancaster, Mass.

E. O. Orpet.

Iris cuprea.—Of the species of Iris now in flower this is one of the most distinct and attractive. The leaves are sword-shaped, slightly lax, and grow to a height of about eighteen inches in a dry position. The flowers are rather numerous, and of a peculiar dull copper-color, quite distinct from any others in the same family. The standards and falls are broad, and in some stages form a flat flower somewhat in the style of *I. Kæmpferi*. A native of the southern states, this plant probably requires a rather warm place. It proves a thrifty plant in such a position.

Iris ochroleuca, or *I. gigantea*.—This may be recommended where a noble tall-growing variety is desired. The leaves are deep green and about three feet tall, above which the long stems carry the clustered white, slightly mauve-tinted flowers with orange markings.

Iris Anglica, in the same border, makes a perfect succession to the Spanish Irises, whose flowers have passed before the middle of the month. Both sections of these bulbous Irises are desirable and popular garden-plants, but require care in the selection of a suitable position. They evidently need a dry hot place, where the bulbs will roast while resting. The Spanish Iris throws up its leaves in early winter, and sometimes there are complaints that these are injured in hard weather. Mine, planted under the lee of the house, have never so suffered, and prove reliable plants. Their flowers are quaint beauties, showing great variety, though not as large as the English Irises, neither are the plants so vigorous. Of the English varieties the white variety, *Mont Blanc*, is a well-known kind, very beautiful and desirable for a special clump.

Elizabeth, N. J.

J. N. G.

The Forest.

The Woods of Minnesota.

IN the nineteenth Annual Report of the Geological Survey of Minnesota, the State Geologist, Professor N. H. Winchell, has devoted a chapter to the forests of that state, and has entrusted its preparation to Mr. H. B. Ayres, then agent of the Forestry Division at Washington. In his general description of the forests of the state Mr. Ayres separates them into groups, the most important of which is the White Pine region, varied with hardwood, Norway and Jack Pine, Cedar and Tamarack swamps, with open or Spruce bogs bordering the numerous lakes or occupying

their old beds. This region is so well watered and has so little fall that very little of the White Pine is more than five miles from streams through which it can be driven. Nearly all of the streams head in the open bogs, which, where partly shaded by Spruce, make an enormous growth of sponge-like Sphagnum-moss, and this holds the ice of winter until June or July, and preserves a supply of water, so that the explorer may find it under some upturned root well into the droughts of August and September. The soil is usually loam or clay, and supports a considerable growth of hardwood, among which the White Pine reaches its most perfect development. To give some idea of the recent history and the prospects of this region we quote directly from Mr. Ayres' paper:

Much of this whole area was stripped by fire even before the loggers increased the liability to fire by the tops they leave in the woods, and by the greater drying of the forest-floor by exposure to the sun and wind in the openings they have made. It has been estimated that thirty years ago over 40,000,000,000 feet of Pine were standing on the 25,000,000 acres of forest in the state. Since that time busy milling-towns have started up here and there as if by magic, and loggers and choppers have swarmed into the forest until the average number of men now employed in preparing forest-products for market reaches about 17,000, and the value of the product as placed upon the market amounts to about \$31,635,000.

Must the industry soon decline? The answer is a prompt and positive No.

If timber were a deposit like beds of iron-ore, with no power to reproduce itself, we could readily estimate the time of the end. In such a case we could see that, with the present supply of standing timber, say 20,000,000,000 feet, seventeen years more would leave the state stripped. But where fire is kept out forests reproduce themselves, and the accretion by growth, while small and of comparatively little value in woods cut without any view to reproduction, in woods cut at such a time and in such a manner as to give the seedlings and sprouts the best chance to make a rapid "second growth," the annual increment under the best forest-management in Europe has averaged about fifty-five cubic feet per acre, one-third of which should be estimated as log-timber. To produce an annual growth of 1,200,000,000 feet B. M. (the latest annual cut) would at this rate require 5,500,000 acres.

In mournful contrast with these results obtained in Prussia, stands the estimate, though roughly made and presented with some hesitancy, yet approximating the fact, that the 24,960,000 acres of wooded area in the state did not last year grow more than 200,000,000 feet B. M. of log-timber. In other words, 50,000,000 acres of such forest as ours in its present condition would be required to grow the amount grown on 5,500,000 acres of well-managed forest, and our forests are thus only producing less than one-ninth of what they might. We must not, however, forget that of the 24,960,000 acres now wooded, probably one-half will eventually prove more valuable as agricultural than as forest land, and should be partly cleared. This would leave the area that should always be kept in forest—that is, the lands unprofitable for agriculture as compared with forestry, about 12,500,000 acres, which should, under management, produce twice our present annual cut of log-timber, and 400,000,000 cubic feet of other material for wood-working, fuel, etc.

Every considerable tract of forest in the state is more or less depleted by fire, and can only be brought into full production after many years of renovation; but should any reader be tempted to cast these estimates aside as overdrawn, I must ask him not to do so without a careful study of the subject, such as I have given it during four years of exploring that have taken me all through the wooded region and formed in me a deep conviction that, while these estimates are necessarily rough, they are based on sound principles, and at least point toward and approximate the truth.

Theoretically, therefore, it seems possible that the present yield of log-timber alone may be doubled permanently and that a vast increase of manufacturing industries would follow the assurance of a constant supply, and, locating themselves throughout the woods, would in every way tend toward the greatest development of the state. Practically, however, the difficulties in the way of attaining this ideal state of affairs are so great as to try the determination and skill of our best citizens.

The difficulties attending the question of ownership before operations of any kind can be commenced are the greatest that are to be met in the whole subject. In Europe, however,

where claims of private owners were everywhere to be adjusted before anything could be done, this great barrier has been overcome satisfactorily to all. In this country, where so much of the lower grade of agricultural land is owned by the government, there should be great hesitancy in making a beginning, beyond the caution necessary to make sure that the course be the right one. In Europe the great difficulty has been just as here, the prejudice against anything but the free use of public property and against interference of the government in the business of individuals. But they have, first in the mountains where the general welfare most plainly demanded it, by condemnatory proceedings, and later, on the poorest lowlands, where the direct profits of forestry are greater than those of agriculture, by bounties to the owners of the land, made such progress during the past century that the wisdom of the movement is plainly shown, and all men who have the chance to know, combined with a desire for the public good, write in sustaining the governmental policy of securing the perpetual cultivation of forests on all the poorest lands.

Correspondence.

Impressions of America.—I.

To the Editor of GARDEN AND FOREST:

Sir,—My first impressions of America were received in the beautiful fall of the year. I came to Boston on a Monday, early in October, after a morning sail up the harbor where the dark brown summer hotels and cottages, encircled by broad piazza roofs, looked to my astonished eyes like gigantic fungi planted in the bare grass. After a dazed and lonesome day in Boston and bewildering experiences with imposing darkies and strange things to eat at a solemn hotel, I was taken out to Wellesley Hills by a kind friend, and thus introduced to a suburban town while everything was quite new to me. Our voyage had been a long and a stormy one and had left my mind as complete a blank as any traveler could desire. All was, indeed, so new to me that it made no impression at all, beyond a vague general one of great and wonderful strangeness. Some things there were to remind me of my own country, Sweden, while I caught occasional glimpses that recalled France. From among features of house and landscape, something would flash across my vision that had no association with anything at all that I had ever seen or pictured in fancy. Supper brought sword-fish—an animal connected in my mind with museums and picture-books, not with the dinner-table; a curious vegetable, fit food for the gods in its rich color and aromatic, poetically suggestive flavor, which they called sweet-potato; an outlandish, highly spiced tea, which they called Oolong; a variety of light tempting breads and delicious stewed fruit, all served up at once in home-like abundance and suggestive of a land of new products and boundless resources.

Next morning I started on a walk through the village, full of eager curiosity, unaccompanied, as I wished to receive unbiased impressions. It was all very strange, utterly unlike everything I had seen before of any known or tried principle of arranging human dwellings. On either side of a splendid avenue, too broad and lofty to be oppressive, arching more grandly and lightly than most avenues in Europe, little houses, as contorted and fantastic as if they represented wants and tastes quite different from ours, were set in rows in the grass. Each house had a straight little path leading up to the front door, creepers trailing over the piazza, a few fruit-trees or a row of evergreens in the grass in front of it, but not a sign of a hedge or a fence visible anywhere. Flowers, too, were rare, but vistas of sunny plain showed in the open spaces between the houses, and in the morning light it all looked so new to me, so broad and open and suffused with light, that I suddenly felt as if I had climbed the Bean-stalk in the night and was wandering about dazed in a new and strange world, of bright light, quaint customs, and unbounded friendliness and good-fellowship of intercourse.

My walks in the woods, alone or with friends, were full of delightful experiences, very bewildering at first when I encountered Blackberries that grew on trailing vines instead of on stiff tough brambles, as they do in Europe, or Maples with leaves so deeply indented that they look like Oaks, while the most prevalent Oaks, with their regular build, their burnished foliage and the clearly cut symmetrical form of their leaves, almost like a conventionalized Acanthus, did not at all answer to my English ideas of an Oak. The Elms were graceful, spreading things, not the heavy clumps of massed foliage that I was accustomed to in England and elsewhere. In between these

new forms and manifestations were well-known European trees or features of landscape, low picturesque stone walls, that I thought impossible out of stony treeless western Sweden, running along below huge Chestnuts, like those I had seen last in the mountains above the Italian lakes; hill-formations and road-side ponds or bits of Oak and undergrowth so characteristically French that it was like seeing a succession of landscapes by Daubigny, Cazin and Rousseau. Add to this the sight of the White Pine, that pride of our evergreen shrubberies, growing wild; Sycamores and Plane-trees, with foliage either much more magnificently grand or much more minutely delicate than in average central European specimens; sylvan forms on the grandest scale in endless variety; long threads and tangles of Virginia Creeper thrown up among the branches of the old trees like Lianas in pictures of the tropics; or something still more suggestive of the tropics, a beautiful vine, now turning deep red, which I was warned against as poisonous; stray flowers of refined beauty in the ditches, and the clearings full of a feathery shrub; the Sumach, interspersed with a tall exquisite plant, the Milk-weed, eminently Japanese in its pale green color and the quaint pear-shape of its large pods; more old friends in new places and unexpected glimpses into a picture-book world, until it all seemed to me like the title-page of some old illustrated book of geography, on which plants and trees from the different countries are arranged in picturesque confusion.

Besides the combination of opposites, the prevailing impression was one of luxuriant profusion. I remember passing through an orchard and being told to pick up a sweet apple which fell at my feet, a thing I would not have dreamed of doing in an orchard belonging to strangers in Europe. A sweet apple in Sweden has a flat, insipid taste, but this had a rich lusciousness of flavor and an abundance of juice that seemed to me truly to symbolize America.

Underlying all this there was something disappointing and inconsistent that disturbed me, though I could not explain it to myself. I can explain it now only too well, and as the explanation is my sole excuse for setting forth all these personal impressions I shall give it here. I know, now, that I was disturbed by the inconsistency between the luxuriousness of the woods and the barrenness of the gardens. In our daily life I did not notice it much. The piazza, with its translucent screen of vines, the still sunny air over the Apple-trees and the grass, were very pleasant after my voyage, and the sociability existing between the different houses in this Jack-o'-the-Beanstalk land was very quaint and amusing. But every walk in the woods made the bare front yards I passed on my way home seem more and more astonishing and finally painful to me.

Since then the well-known fascinating power of America has been at work, and I have learned to look upon her more as a country which I have a right to be interested in and to criticise from the standpoint of my sympathy and admiration than as a foreign land to be observed with cold and dispassionate curiosity. Further acquaintance with suburban districts and gardens has only served to deepen and give clearness to my first impressions. New England seems the land of boundless resources, of unlimited possibilities of beauty within the fine art of gardening. But the fine art of gardening is as yet only a luxury of the wealthy.

Milton, Mass.

Cealia Waern.

The Wellesley Gardens.

To the Editor of GARDEN AND FOREST:

Sir,—The gardens at the country home of Mr. H. H. Hunnewell, at Wellesley, Massachusetts, are certainly unique, and rank among the very best examples of modern horticulture in the United States. In extent and completeness they resemble the spacious old gardens of Europe more closely than most others in America, and the forms of gardening carried out are so numerous and well maintained that the place has hardly a superior anywhere. The natural features of the place have been carefully studied, its beauties emphasized, and its less interesting portions relieved by plantations in which the trees are artistically grouped, or arranged in vistas which carry the eye to where distant woods and skies unite upon the horizon-line. The house itself is situated on something of an eminence, overlooking the picturesque Lake Waban, whose shores exhibit beautiful lines with jutting bluffs, and sweeping inlets, and they are finely wooded on all sides. The buildings of Wellesley College rise grandly on the right, their classic designs and lively colors imparting brightness and a certain oriental luxury to the scene. The place, too, has taken on

much of the dignity which comes with age—a too rare feature of American gardens.

The most experienced gardener may learn much at Wellesley, and he can find many object-lessons there at any time. The attractions of the place are particularly numerous and varied at present. The "Italian Garden" (see GARDEN AND FOREST, vol. ii., p. 103), so-called, is worth a journey from any part of the United States, to those who have never seen anything of the kind. It occupies the sloping ground between the house and the lake, and consists of a series of terraces on which trees and hedges of various kinds, clipped to formal patterns, are growing. This kind of ornamental gardening originated with the Dutch at an early period, and was copied in later times, with some modifications, by the horticulturists of several other European countries. There are only a few of these gardens now in existence, and that at Wellesley is the only one of any considerable extent in this country.

The plants at Wellesley are in many cases not the same as those employed in European examples of topiary work. The Hemlock, Beech (both the purple and green forms), Norway Spruce, White Pine, Scotch Fir and Arbor Vitæ are the most plentiful. A low wall on one of the back walks is decorated with tall, columnar specimens of Juniper and Irish Yew, arranged on the flat top in the form of a colonnade. These two latter plants are grown in tubs for greater convenience in storing, since they are not hardy here.

Glimpses of a large white tent in another part of the grounds now strike the eye through the shrubbery, and on investigation it is found filled with handsome specimens of greenhouse Azaleas. The pots are plunged to the rim in the sod, and the plants are so well arranged that they seem to be in permanent position. There is no sheeting to the sides of the tent, but there is a large plantation of hardy Azaleas on the outside, and the soft colors of their flowers form a charming background to the brighter blooms within. Several large trees, beautifully draped with white and purple Wistarias, are also noticeable in close proximity, and Mr. Harris, the gardener, called attention to some specimens of a very good new Japanese Azalea, which had proved perfectly hardy at Wellesley last winter. This is certainly an acquisition as a hardy plant, the flowers being large, handsome, and of a rich purple shade.

The simple, daisy-like flowers of the Marguerite (*Chrysanthemum frutescens*) were very attractive on large specimens around the base of the central tent-pole. This is an admirable decorative plant, as easy to grow as a weed, though it will not stand frosts, and it may be made useful in a thousand ways.

The Rhododendrons are a striking feature of the place, and they are to be found in large groups on every side. They bloom during the early weeks of June, and their magnificent trusses of flowers are then distinguishable miles away. The plants like a peaty soil that is moist and cool, and a thorough mulching of litter tends to preserve these conditions in very hot weather. Mr. Harris assured me that it has been amply demonstrated by experiment that the most important varieties of Rhododendrons require no protection in winter at Wellesley. This is encouraging for those who wish to grow these most desirable shrubs, for the climate of Wellesley is by no means mild. The statement of Mr. Harris is doubtless true as regards immediate protection, but in no case, as far as I could see, are the plants wholly unsheltered on dangerous sides. The position of the plant is often its protection, and the trees and hedges adjacent to the Wellesley plantations of Rhododendrons go far to preserve them from destructive winds and sunshine.

The Rhododendron beds are edged with variegated Funkias, and there are many splendid specimens of rare conifers about the grounds. Limited time allowed me only a glance at the interesting rockery convenient to the Italian Garden, but I noted the variegated form of *Evonymus radicans*, almost rivaling *E. latifolius variegatus* in the proportions and excellent color of its leaves, and the large bushes of *Kalmia latifolia* in bud, promising a rich display of bloom a few days later.

Some Peach-trees and Grape-vines in the fruit-houses gave every indication of heavy crops, and the numerous structures devoted to stove and greenhouse plants were amply stocked with general material, and gave evidence of high cultivation. A large area of glass is taken up with choice Orchids. These plants especially are all in the most vigorous health, and many of them are flowering profusely. Their excellent condition is largely due, without a doubt, to the rich liquid manure which is freely applied to their roots. The conservatory adjoining the dwelling-house contains a fine collection of Orchids in bloom. The plants, even the best of them, are far too numerous to specify, and they produce an effect which in itself is worth a journey of many miles. I cannot refrain,

however, from mentioning *Dendrobium Wardianum*, which was represented by a large number of specimens, conspicuous for their superb condition at a period of the year so far advanced. A grand plant of *Medinilla magnifica* occupied a prominent position in the same house. The temporary awning directly outside covered well-grown *Achimenes*, *Gloxinias*, *Imantophyllums*, *Calceolarias*, *Pelargoniums*, *Fox-gloves* (first-class in pots), *Spiræa Japonica grandiflora*, *Wistarias*, *Eurya latifolia* and *Rhynchospermum jasminoides*.

It has taken over forty years of persistent and intelligent care, with a great outlay of money, to make the gardens of Wellesley what they are to-day, and in view of this it would appear ungracious to close this notice without an allusion to the public spirit and generosity of Mr. Hunnewell in throwing all these horticultural treasures so freely open to the public.

Cambridge, Mass.

M. Barker.

Albinos among Orchids.

To the Editor of GARDEN AND FOREST:

Sir,—In your issue of March 23d J. T. describes the finding of a white-flowered plant of *Habenaria psycodes*, and asks if any one else has ever found one.

On the 30th of last July I collected what I judge to be the same variety, along a damp road-side a few miles from North Anson Village, Maine. The white variety was almost as abundant as the type, with which it grew. The specimens were new to me, but on account of their number were supposed, at the time, to be some ordinary white-flowered *Habenaria* common to the region. They were placed in the vasculum without even a thought as to what species they might be. On account of their beauty a handful of the spikes, both white and purple, was collected as a bouquet, and a very pretty one they made.

Upon returning to the village it required but a moment's examination to identify the flowers, the variation from the type being very slight, except in the pure white of the flowers and the less deeply fringed lips. Although the white-flowered plants were not examined critically or compared with the common variety at the time of collecting, the impression received from subsequent observation is that the white form is an albino, and not a hybrid, as was suggested to your Norwich correspondent. The flowers discolor in drying as quickly as do those of some other allied species.

Providence, R. I.

J. F. Collins.

Preference of Birds for Certain Trees.

To the Editor of GARDEN AND FOREST:

Sir,—I quote the following passage from a recent number of the *Mediterranean Naturalist*:

"It is remarkable that no writer has noticed the preference that certain species of birds give to certain trees. Jays and rooks are found in the greatest numbers in Oak-trees, finches in Lime-trees, and black-caps among the Laurels. The nightingale is always found in the greatest numbers in nut-groves, while the thrush evinces a decided preference for the Birch and Ash. The Beech is the favorite tree of the woodpecker, and the numerous families of tits are generally found in the greatest abundance among the Black Thorns."

I am not familiar enough with birds, or with books about birds, to know whether this writer is, indeed, the first to call attention to such preferences. Perhaps some of your readers can say whether they have been observed by American naturalists, and, if so, whether the American relatives of the birds here mentioned are akin to them in their tastes.

Trenton, N. J.

H. J. K.

The Effects of the Winter.

To the Editor of GARDEN AND FOREST:

Sir,—Judging from recent correspondence in your journal, the past winter has had unusual effects upon trees and shrubs in New England. It is certainly so with us. Here, in the Atlantic provinces of Canada, we had very little snow in early winter, and a late and dry spring. I expected to find grass-fields suffering from the exposure, but cannot see now that such is the case to any unusual extent. In this town, however, and in the immediate neighborhood, Raspberries of the hardiest varieties have been winter-killed so badly that not one cane in a hundred will show a blossom; while hardy Roses, usually killed back for one-third or one-half their length, are coming out better than I have ever seen them in some twenty years of observation. The only other remarkable thing noticed

is that we have lost all the Trumpet Narcissus, usually very hardy here, while the double form of *N. poeticus* is better than usual.

St. Stephen, N. B.

J. Vroom.

Notes.

We have received a few flowers from Rea Brothers which are labeled *Achillea Mongolica*. They are long-stemmed, white semi-double flowers which are said to bloom earlier than either *A. ptarmica* or *A. serrata*.

The delicate and fragrant flowers of *Clematis crispa* have been opening for a week, and they will continue to appear every day until the time of heavy frosts. This is one of the climbers which can be recommended for every garden.

Robinia Neo-Mexicana is flowering this year in the Arnold Arboretum, probably for the first time in cultivation in America. It is a small tree, a native of the southern Rocky Mountain region, and the only representative of the genus in western America.

Mr. James MacPherson writes from Trenton, New Jersey, to the *American Florist*, that a bulb of the variety *Superbum* of *Lilium Wallichianum*, planted out last year on a steep bank and covered with a little litter, has survived the winter and is now growing strongly.

In speaking of the readiness of the various Columbines to vary and hybridize, Mr. T. D. Hatfield writes of a giant form of *Aquilegia Canadensis* which has the perfect flower of the type but shows in a striking way the habit of *A. vulgaris*. This plant is usually three feet in height.

The second instalment of Professor Coulter's *Manual of the Plants of Western Texas*, embracing the Gamopetalæ, has appeared, forming Number 2 of the second volume of the *Contributions from the United States National Herbarium*, published by the authority of the Secretary of Agriculture.

Dr. H. T. Bahnson, of Salem, North Carolina, sends us flowers of a new seedling *Nymphæa*. They belong to the same type as those of *N. alba*, a light shade of pure pink in color, with petals numerous and very broad. The flowers are bold, as large as those of *N. alba candidissima*, and quite distinct. The new variety is evidently a desirable one.

By ministerial decree a committee, consisting of Comte de Choiseul, President; Edward André, Vice-President, and Henri L. de Vilmorin, Secretary, has been appointed by the French Government to represent French horticulture at the Chicago Columbian Exposition, and Monsieur André has been entrusted with the duty of preparing the plans for the garden of the French section of the exhibition.

Professor Penhallow writes to the *American Geologist* of two specimens of fossil wood which were recently exhumed from different places in Manitoba. Microscopical examination shows that they are identical and that they possess characters approaching both *Larix occidentalis* and *L. Americana*, but are, in other respects, quite distinct from both. The specific name, *L. Churchbridgensis*, has been given to this fossil tree which seems midway between the Larches named above in the qualities of its wood.

The white form of *Wistaria multijuga* has been flowering profusely this year in Mr. Hunnewell's garden at Wellesley, Massachusetts, as well as in the Arnold Arboretum. It is a beautiful plant, perfectly hardy, and produces racemes of flowers varying from two feet to thirty inches in length. These appear after the flowers of the Chinese *Wistaria* have fallen and when the leaves are fully grown; they possess, moreover, a delicate fragrance hardly distinguishable from that of the flowers of the common Locust (*Robinia Pseudacacia*).

At the tenth annual convention of the American Seed Trade Association, held in Hartford last week, a communication was received from Mr. F. H. Mason, American Consul at Frankfort-on-the-Main, in which he stated that threatening letters from this country have been received by German seedsmen intended to prevent them from making an exhibit of their products at the World's Fair in Chicago. The association at once passed a resolution condemning all efforts of this sort and declaring that none of its members have ever participated in any such a movement. They expressed a hearty desire to have at Chicago the fullest representation of all the products in the world connected with their business.

The death is announced of Jacques Julien Margottin, a man known by name wherever Roses are cultivated, as his reputation as a rosarian, especially as a producer of new varieties, has extended throughout the world, and his nurseries at Bourg-la-Reine have long been famous for the collections of his favorite flower. In the long list of Roses which originated in his establishment the best known at the present time are Jules Margottin, Gloire de France, Triomphe de l'Exposition, Duke of Cambridge, Lord Palmerston, Madame Van Houtte, Belle de Bourg-la-Reine, Jean Goujon, Louis Margottin, Souvenir de Poiteau, Charles Turner, Triomphe de France, Gloire de Bourg-la-Reine and Henriette Pettit.

A bill authorizing the Governor of Massachusetts to appoint three persons to be known as the Metropolitan Park Commissioners has recently been enacted. It provides that these commissioners, who are to serve without compensation, shall consider the advisability of laying out ample open spaces for the use of the public in towns and cities in the vicinity of Boston, with authority to make maps and plans of such places, and collect all information necessary for acquiring, laying out and maintaining them. This is the bill which originated with the Trustees of Public Reservations, and its object is to provide some means by which the Middlesex Fells, the Blue Hills, and other tracts of wild unimproved land in eastern Massachusetts may be acquired for the benefit of the public.

The splendid Gladioli which now ornament all American gardens, from the finest to the humblest, when summer is at its height, are, as every one knows, natives of the Cape of Good Hope, greatly improved and infinitely diversified by cultivation. But perhaps it is not as generally known that the old-fashioned hardy species, bearing a few small rose-red or rarely white blossoms, which our grandmothers loved long before its showier cousins became the fashion, is of European origin, and is, indeed, a familiar field-flower throughout central and southern Europe. In those parts of southern France where the festival called the Fête Dieu is still publicly observed, its varieties are more generally employed than any other flowers to decorate the canopies borne in the processions and the little shelters where they halt.

"Nothing is more common," recently wrote Mr. Grant Allen, "than to see classical pictures of the Alma-Tadema school—not, of course, from the brush of the master himself, who is impeccable in such details, but fair works of decent imitators—in which Caia or Marcia leans gracefully in her white stole on one pensive elbow against a marble lintel, beside a courtyard decorated with a Pompeian basin, and overgrown with Prickly Pear or 'American Aloes.' I need hardly say that, as a matter of plain historical fact, neither Cactuses nor Agaves were known in Europe until long after Christopher Columbus had steered his wandering bark to the sandy shores of Cat's Island, in the Bahamas. But this is only one among the many pardonable little inaccuracies of painters, who thrust scarlet Geraniums from the Cape of Good Hope into the fingers of Aspasia, or supply King Solomon in all his glory with Japanese Lilies of the most recent introduction." It is well, of course, to have attention called to such anachronisms in art. But perhaps Mr. Allen will realize how difficult it is to be accurate in matters outside one's own special province when his notice is called to the amusing little architectural blunder he perpetrates in the paragraph we have quoted. It would be hard for either Caia or Marcia to lean, gracefully or ungracefully, against a marble lintel, since the dictionary defines lintel to mean "a horizontal piece of timber or stone over a door, window or other opening." What Mr. Allen meant to say was probably sill or jamb; and, doubtless, what the painter of King Solomon meant to paint was a Lily, not of Japan but of Palestine.

Catalogues Received.

WILLIAM BULL, 536 King's Road, Chelsea, London, S. W., England; New, Rare and Beautiful Plants and Orchids.—THE COSSIPORE PRACTICAL INSTITUTION OF HORTICULTURE, FLORICULTURE AND AGRICULTURE, Raja's Park, No. 69 Gun-foundry Road, Cossipore, near Calcutta; Ornamental and Rare Plants.—H. GUSMUS, Klagenfurt, Austria; Flower Bulbs and Roots.—JOHN LAING & SONS, Forest Hill, London, S. E., England; Plant Catalogue of Hardy Perennials, Alpine and Border Plants, Florists' Flowers, etc.; Catalogue of Tuberosous Begonias.—PILKINGTON & CO., Pearmount Nursery, Portland, Ore.; Ornamental Trees and Plants.—SHERWOOD HALL NURSERY CO., Menlo Park, Cal.; Trees, Plants, Seeds and Bulbs.—JAMES VEITCH & SONS, 544 King's Road, Chelsea, London, S. W., England; General Catalogue of Plants and Novelties for 1892.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLES:—Restful Burial Grounds.....	301
Pretenders in Landscape-art.....	302
A Corner in Pines.....	Mrs. F. H. Robbins. 302
The Great Elm at Derby Line. (With figure.).....	T. H. Hoskins, M.D. 303
PLANT NOTES:—Some Recent Portraits.....	303
NEW OR LITTLE-KNOWN PLANTS:—Hypericum opacum. (With figure.)...C. S. S.	304
FOREIGN CORRESPONDENCE:—Knap Hill Nursery.....	Visitor. 304
CULTURAL DEPARTMENT:—Iron-clad Stocks—The Graft-box Fungus,	
T. H. Hoskins, M.D. 306	
Choice Herbaceous Plants.....	Robert Cameron. 307
Fern Notes.....	W. H. Taplin. 308
Narcissus poeticus.....	G. H. Engleheart. 308
CORRESPONDENCE:—Impressions of America.—II.....	Cecilia Waern. 309
Is Spraying Overdone?.....	Professor L. H. Bailey. 310
A Good Example.....	F. N. G. 310
PERIODICAL LITERATURE.....	311
RECENT PUBLICATIONS.....	311
NOTES.....	312
ILLUSTRATIONS:—Hypericum opacum, Fig. 54.....	305
The Great Elm at Derby Line, Vermont, Fig. 55.....	307

Restful Burial Grounds.

TWO articles published recently in these columns call attention to the charm of burial grounds where the attention is not distracted by decorations inappropriate to the scene, and the writer commends the Walnut Hills Cemetery, in Brookline, Massachusetts, and the Quaker burial grounds for their absence of showy adornment and monumental display.

We have already stated that it is the effort of superintendents and trustees of burial grounds to so dispose them that there may be a certain unity of design in their arrangement, and to make the parts subordinate to an agreeable whole; but there is a difficulty in reconciling the public to any interference with what seems an individual privilege, and it is hard to make people realize that what is of great significance to them may be a fatal blot in the whole picture as it presents itself to the general eye. But the education of taste goes on imperceptibly; given the canon, and in time it will commend itself to all; though the general instinct now is that every one has a right to express his sense of loss and his recognition of the value of the departed in such fashion as may seem to him appropriate. But, as in crowded grave-yards, the lack of beauty becomes more apparent as the work of the stone-cutter overpowers the work of nature, and this shows that somewhere a halt must be cried to personal fancy, and an endeavor made to introduce permanent beauty.

Those who remember the great cemeteries near our larger cities as they were fifty years ago, when their fine natural advantages of hill and dale, of wide outlook, or shadowy recess, were only here and there interrupted by grave-stones, and contrast them with their present aspect of closely crowded iron and marble, must regret that some controlling taste did not long ago intervene to preserve all that beauty by insisting upon monuments so small and unobtrusive that the trees and natural loveliness of glade

and elevation would still be the most apparent features of the spot rather than painful rows of glaring marble, often violent in design and imperfect in execution, or masses of flowers and colored leaves that are more curious than beautiful and appropriate. To this degree of taste people must be educated, and their expression of ornament controlled until they arrive themselves at the point where their own understanding commends a chaste and simple record of the departed in lieu of striking monument or elaborate inscription. What men like is a sure test of their æsthetic development and refinement, but even the artistic sense is the result of long and careful training and of constantly reiterated precept and of carefully studied example.

Since a cemetery must of necessity be conventional, as few monuments or grave-stones depart from some well-known and often repeated pattern, it seems right that such conventionality should be subordinate to a general plan which should combine all detail in one fair and noble conception of satisfying and restful beauty; so that a burial ground ought to be endeared to us, not only by the memory of those who sleep there, but by the grand groups of trees, the well-considered arrangements of shrubs and flowers appropriate to the scene, which would give to the whole ground a dignity and impressiveness forever to be associated in men's minds with those they have loved and lost. With the consciousness that years will increase and not detract from the beauty of the hallowed spot, affectionate thoughts can cluster around that serene resting-place, and draw us thither more and more willingly. For such a result canons of taste are imperatively necessary, and a few simple ones at least may be laid down for the guidance of those who earnestly desire to know what is truly befitting for so dear a spot.

In the first place it is admitted that no visible boundaries should be permitted between the lots, neither fences, nor hedges, nor copings of stone or marble, nor should the place where the dead lie be indicated by a mound.

A simple and artistic stone, ample enough for such inscription as is required, should be provided; but no tall conspicuous monument nor massive sarcophagus should be admitted, and it would be well if marble should be wholly excluded, as its keen whiteness is a constant shock to the eye, and always fails to blend harmoniously with surrounding verdure. Such shrubs and flowers as would be grouped here ought to be so disposed as to conduce to unity and breadth of effect. No individual desire to plant a rose-bush here, a willow there, should be permitted to interfere with a design which is not for the one but for the many, an effort to create one large and lovely dwelling for the dead, rather than a series of unlovely patches unrelated in design and ruinous to the general beauty of the scene by their lack of harmony with one another. It was this character of unobtrusiveness that inspired Gray's Elegy. The quiet graves where "the rude forefathers of the hamlet sleep" are destitute of stately monument. We can see the gray church with its clustering sunken stones about it today and realize the tranquil charm of that peaceful old churchyard, which needs no shining cenotaph nor glowing beds of flowers to make it live forever in our memory.

Restfulness and peace. What else do we need in our last home? Shall not the fresh flowers strewn by some loving hand upon our lowly couch be the best token we are unforgotten? Why, then, should our final sleeping-place be pranked out with marble and gaudy show of blossom? Rather let some quiet gray stone indicate our resting-place, and evergreen ivy drape it with its sombre leaflets, while over all may arch the boughs of ancient trees that shall bestrew it in spring with blossoms, and in autumn with the soft covering of its falling leaves. The reason for simplicity in burial places is obvious. It is not here that the memory of the wise and good is to be preserved. That lives in the minds of men. Here lies the common dust of which we all are made, and to which we are to return. Death, the great leveler, here makes an end of our pretences; before the Destroyer all are alike. Let,

then, the record be humble, since to this lot we come at last. All now are equals before the King, and efforts to maintain the distinction between lofty and lowly may well be dispensed with on our tombstones.

In a recent issue of this paper we spoke of the work of Messrs. Olmsted & Co. at the Columbian Fair, at Chicago, in connection with that of the architects to illustrate the true function of landscape-gardening or of landscape-architecture, as many members of that profession prefer to style it. We tried to show that very often the planting of trees, shrubs and flowers was a comparatively insignificant matter, a minor detail of a general design which is meant primarily to solve in a matter-of-fact way serious problems relating to comfort, health and convenience, problems of every-day practical and economical moment as well as questions of exterior appearance and adornment. Of course no one is competent to give advice on subjects of such vital importance to the owners of private grounds or to the people who make use of public grounds, without careful training. As we have pointed out, the profession deserves to rank with architecture among the arts of design, that it means something deeper than the making of pretty pictures on the grass, that the questions to answer are so weighty that no one has a right to assume the responsibility of facing them who has not added to an original aptitude and a correct natural taste the expert ability that comes from long and careful study. And yet there is danger that, as the value of counsel in this direction comes to be more generally recognized, there will be no lack of unskilled persons ready to call themselves landscape-gardeners, and to work untold harm upon confiding clients.

Not long ago a large sum of money was voted in one of our flourishing cities for establishing a park, and the regular administrative body who had the matter in charge promptly selected the foreman of a neighboring florist's establishment to make the design because he offered to do it cheaply. There was no question among these trustees as to his capability, because it was assumed that a man who knew all about the refinements of floriculture was master of the coarser work of "laying out grounds." A little reflection ought to have convinced these commissioners that a good design is always the cheapest; that even in this lower view of the matter the fee of a trained artist will always be saved many times over in the work of construction alone, while, after the plans have been carried out, the park will be constantly growing in beauty and usefulness as the years roll on. A plan which does not take advantage of all the possibilities of the situation and adapt them to the special needs of the city will be a disappointment at the outset. This means that the designer should be a man of wide intelligence and foresight as well as an artist in the highest sense of the term. An imperfect design will be a disappointment at the outset, and it will bring about an endless series of makeshift revisions and patchwork amendments, and, in a word, will be a costly failure. And yet there is no security now against the repetition of such mistakes.

In this profession, as in others, education must ultimately come through the improved taste of the people at large. Public works and private places will be at the mercy of journeymen until it is recognized that it is a fine art to design a park or to make the proper adjustment between a private dwelling and its surroundings so that the aspect and outlook of the house, its situation and its approaches and all its relations to the grounds shall be consistent, practical and in accord with the highest canons of taste. Even then there will be incompetent designers in this profession, just as there are architects who constantly sin against the very foundation principles on which true art rests. But the popular taste improves as good buildings are furnished for observation and comment; and popular taste in landscape-art will in time be educated, let

us hope, until there will be no place for quacks or pretenders in the profession.

Meantime it is the duty of every one who seeks professional advice in this direction to employ only those who have credentials which guarantee their competency.

A Corner in Pines.

THE planting of a bit of woodland teaches a great many virtues, but perhaps its most obvious lesson is that of patience, which it sometimes unexpectedly rewards just when one's expectations have been finally resigned as vain delusions. Such a reward and delight was ours in the result of a broadcast sowing of Pine-seeds in the autumn of 1888, so, for the comfort and cheer of those who may be downhearted about their own apparent failures, I wish to record the story of a final success.

When we started out to reclaim the worn-out old pasture on the hill at Overlea we set out a great many little evergreen trees of different sizes, a fair proportion of which survive in a vigorous condition, the smaller ones, planted when a foot high, being altogether the most satisfactory in percentage of survival. But Pines are queer; there is no denying that. Sometimes, when a tall weedy one was brought home, there were many jibes from the head of the family upon the folly of expecting such a specimen to stand the weather even for one season, while the merits of a stout, stocky, burly bush were highly extolled as a promising contrast. But now and then the burly bush succumbed, while the thin weedy tree pulled through, very much like some of those scrawny and tall New Englanders, who, though looking as if a high wind would blow them away, prove to possess a tough and staying quality which nothing in their looks presages.

Now, having had it affirmed as a fact that a hundred Pine-trees to the acre were enough if they all grew, nothing would really satisfy us but to put in a thousand to start with on about an acre and a quarter of stubborn soil. That is the true American spirit—a desire to overdo. Now, the master, having not much confidence in the methods of the mistress of this farm, concluded in true scientific spirit to begin at the beginning, and plant Pine-seed by the bushel, as the easiest and most thorough way of producing thousands of trees in a woodlot. It was in vain to quote to this opinionated person books on forestry, which stated that the results of sowing seed in the reforestation of France and Switzerland had proved less successful than planting of young trees; he was satisfied, like Sam Patch, that some things could be done as well as others, and that it was no reason at all that because seed was unsatisfactory in the effete countries of the Old World that it would not behave with perfect propriety in the more vigorous and self-respecting climate of Massachusetts, where all the hardy trees and virtues manage to get proper nourishment out of the most forbidding conditions. Therefore, furnishing himself with a barrel of Pine-cones, the doctor went ahead with his experiment.

It was quite a job to shell the seeds, but the factotum found time for this on rainy days in the late autumn, and when the light snow fell the sower went forth to sow, before the resin had time to harden in the seeds and interfere with their fructification. This part of the job accomplished, there was nothing to do but wait for Nature to do her part in furthering the experiment.

Spring came. Up popped little Oaks and Maples and Walnuts and Chestnuts that had been freely planted at the same time as the evergreens, but not a Pine condescended to appear. All through the summer belated nuts were putting in a tardy appearance, but still no Pines. Birds and field-mice were supposed to have devoured them, and we dismissed them from our minds.

A year elapsed. A few unhappy little Pines poked up their heads in sheltered holes, six or seven of them huddled together. We paid them frequent visits, encouraged them to live, piled sods about them to shade their poor little spines, but under an August sun in a very dry summer they withered away. By last year (1891) most of them had disappeared, and there was some scoffing on my part and quotation of authorities to emphasize the fact that Pine-sowing was no good, which the experimenter bore with becoming meekness, while counseling me to wait. But this I concluded was only by way of argument, and because no man likes to admit that he can be beaten by the forces of nature—namely, birds and field-mice.

But in this year of grace, 1892, lo! a miracle took place! When the March winds had ceased to blow and the snow had melted, so that we could walk abroad over the uncut brown grass upon the hill, what should we spy peering up beside the

withered Golden-rod stalks and the ghost of last year's Daisies but thousands of six-inch Pines, rearing their gallant little heads, undaunted by the weather, and evidently come to stay. We hailed them with shouts of delight—here a clump, there a single one, crowding closely in the mossy springy places, more scattered where the soil was thin; but unmistakably there, after all these years of waiting, evidently quite at home, having hidden themselves in the long grass of the preceding summer, while they had been sending down roots so far that when we try to separate some of the denser groups it is really hard to dig them up with a trowel without injuring their fibres.

My scientific companion magnanimously forbore to triumph; indeed, the proud result was as unexpected to him as to me, and was so gratifying that he could afford to accept it with quiet satisfaction.

Some of these little trees, in a spot sheltered from the north-east wind by a clump of tall Birches, have attained respectable proportions, so that we ventured to move them into separate holes. Though taken up on a cool evening with a ball of earth, and apparently no disturbance of their roots, the perverse things wilt and hang down their heads as if they were ready to misbehave, which they have no excuse for doing. On one evening we moved twenty-five very little ones, which all grew in one hole, and most of them bore it very amiably, though some of them perished. As these would have died any way, if left alone in the struggle for the survival of the fittest in that little space, we bore their loss as well as we could, though I must admit that your true planter cannot see the death of one seedling with indifference, which gives a new meaning to the text that "not a sparrow falleth to the ground without His knowledge." If he who plants mourns the failure of one tiny seed, it helps to the understanding of the Creator's interest in all the creatures into which He has breathed the breath of life, for, after all, those of us who struggle to bring to birth or to keep in existence some germ of vegetation approach the great mysteries of being, and feel that we have a hand in it.

Our corner in Pines teaches us a brave lesson. Our joy in our little wood-lot, with its fairy trees, is the greater for being long delayed. What comes easily never has the zest of the pleasure that is waited for. We value a result by the difficulties of its achievement, the triumph of its success. An acre of unsown Daisies is a trial, while a square foot of planted Pines is a satisfaction, showing that a longed-for and slowly reached result is in itself a reward. Our Pines represent the achievement of birth after long and almost hopeless waiting. It is not so much the thought of the majestic forest that consoles as the assured fact that the unstayable seed has started and that it has a future before it. Under the old tree we sit and look back; it represents shelter and repose and peaceful satisfaction. Beside the seedling in its various stages we stand and watch; in it is hope, a future, a long look forward. Age and youth; in each an interest and a joy. In one the delight of fruition, in the other the splendid promise of birth and growth. In the establishment of a tree for coming generations there is an unselfish delight. It is not our own reward we seek, but we lend ourselves to the great forward movement of life, and in that creative instinct feel ourselves elevated and enlarged, at one with mighty forces which we cannot understand, but of which we can avail ourselves by directing their vivifying course.

It is this linking of the humblest with the greatest that lifts existence above the commonplace; that gives to the philosopher, the poet and the artist an ever new meaning and joy in the common things of the earth, which, to him who reads aright, are fraught with significance. To the thinker, as to the poet, the simplest things serve as types which represent the infinite; to them the humble is the high, the microscope as inspiring as the telescope, since each reveals new worlds to the imagination. The seed contains the germ of the tree. One Pine-cone in time will produce a forest, for the progression is geometrical. One acre of ground faithfully studied gives one the key to the problem of the universe; helps to a recognition of the miracle of creation, and, rightly valued, affords perpetual food for the intelligence, while supplying the body with lively exercise.

From our corner in Pines we win hope, amusement and patience. It opens for us a window into the future and an outlook into the immensities; it links us with a hereafter we shall not live to see; with a generation by whom our names shall be forgotten, and proves to us the truth of that vision of the poet, in which he sees that

The whole round earth is every way
Bound by gold chains about the feet of God.

Hingham, Mass.

M. C. Robbins.

The Great Elm at Derby Line.

THE Elm figured on page 307 is doubtless the largest tree in Orleans County, Vermont, if not in all the north-eastern part of the state. It is, unquestionably, a tree of the original forest; and it was, to the eye, nearly as large in all its dimensions when the region was first settled, in the early part of the present century, as now. Its height, by careful measurement, is 102 feet. Three feet from the ground its circumference is exactly twenty feet, while at five feet it is eighteen feet and two inches. Its comparatively small head is probably due to the fact that it grew in a close forest and had no opportunity to spread.

It stands close to the highway, which is also the main street of the village of Derby Line—so named because this street extends to the international boundary line between the United States and Canada, and is continuous with the main streets of Rock Island and Stanstead, Canada. Rock Island is situated upon an island in the Tomefobi River, which is almost exactly on the line at this point, and Stanstead Plain is a village closely adjacent on the north bank. The whole territory for fifty miles around consists of the finest agricultural land. On the Canadian side it is known as the Eastern Townships, in large part settled by New Englanders, who, before the line was strictly defined, "made their pitches" without much regard to where their citizenship and allegiance might fall. In addition to this Yankee element there was a large introduction of English immigrants, mostly soldiers from the disbanded armies of Great Britain after the final overthrow of Napoleon I. There is only a moderate intermixture of the French Canadian element in this part of Canada, and its principal town, Sherbrooke, now a city of some 12,000 people, is substantially of British antecedents and environment.

All this region (as also the valley of the great St. John River, in northern Maine and New Brunswick) consists of what is known as "hard-wood land," although, of course, with much mixture of Pine, Spruce, Fir, Hemlock and White Cedar (*Arbor-vitæ*). It is a rolling, well-watered section, the chief rivers on the Canadian side—the St. Francis and Chaudière, with their tributaries—and many lakes, large and small, leaving the traveler through it not often out of the sight of water. Altogether it is a pleasant land, peopled by an excellent class of farmers, with a considerable manufacturing element on both sides of the line. The vigorous growth and great size of the trees testify to the fertility of the soil, and for general farming, it and its continuation eastward constitute decidedly the best portions of the great peninsula lying east of the Hudson River and Lake Champlain.

Newport, Vt.

T. H. Hoskins.

Plant Notes.

Some Recent Portraits.

IN the June issue of *The Botanical Magazine* are portraits of *Althæa ficifolia* (t. 7237), a native of south-eastern Europe and the Levant, a handsome Hollyhock, long known in cultivation, differing principally from the well-known *Althæa rosea* in the narrow lobing of the leaves, an uncertain character hardly to be depended on to distinguish the species. As a weed of cultivation this plant extends from Persia to Siberia, southern Russia, Servia, and Egypt, and is believed to have originated in north-western Persia. It varies from a few inches to five feet in height, while the flowers vary in color from pale yellow to purple. *Eria marginata* (t. 7238), a little-known Orchid originally described from a solitary specimen believed to have been introduced from Burmah. It belongs to the small section *Hymenolæna*, with cylindric or clavate stems, a few sub-terminal leaves, short peduncles, and large colored bracts. Sir Joseph Hooker points out its relationship to the Khasian *Eria clavicaulis*, which has a small rounded mid-lobe of the lip margined with purple, and to the Ceylon *Eria Lindleyi*, of which the lateral lobes of the lip reach almost the same length as the terminal. It is a small-flowered plant of no great beauty, with white sepals and petals and a lip bordered with red, the middle lobe being light orange color. *Senecio Galpini* (t. 7239), a native of the Transvaal Republic and a rather showy succulent plant with pale leaves and dark orange flowers in dense heads. *Porana paniculata* (t. 7240), a member of the *Convolvulus* family and a native of the East Indies, with small light yellow

flowers in dense compound cymes, in the hot Himalayan valleys climbing over trees to a height of upward of forty feet, and sending down showers of pendulous flowering branches from above; it is described as one of the smallest flowering species of the genus, differing from its congeners in the short style and solid stigma. Eight species of *Porana* are known in India and are spoken of as the most beautiful hedge-plants of that country; two of them are particularly abundant—the species here figured, which abounds from the base of the Himalaya throughout its length to Ceylon and Burmah, reappearing in Java, and *Porana racemosa*, the “Snow Creeper” of Anglo-Indians, a plant confined to the Himalaya slopes, where its masses of dazzling white flowers recall patches of snow. *Porana grandiflora* ascends to eight thousand feet in the Sikkim Himalaya and produces mauve flowers an inch in length. *Rosa pomifera* (t. 7241), a handsome species distinguished by its large succulent fruit from which it has been cultivated from time immemorial.

Begonia Haageana is handsomely figured in *The Garden* of June 4th. This is a beautiful perennial, perpetual-flowering *Begonia* introduced a few years ago from Brazil by the nurseryman of Erfurt in Germany, whose name it bears. It is described as one of the most magnificent of the many *Begonias* known and to be as easily cultivated as a *Coleus*. At Kew there are specimens four feet high and nearly three feet through, clothed with leaves from top to bottom, and covered with flowers, although the largest heads of bloom are produced in autumn, when they sometimes measure a foot in diameter. The male and female flowers are usually borne on separate cymes and are remarkable from the fact that the females do not fall off but remain on the plant until they become green even although not fertilized. This will probably be found one of the most useful of all the winter-flowering *Begonias*, and its early introduction into the gardens of the United States is certainly desirable.

In the sixteenth number of the American edition of *Lindenia*, Monsieur Linden's magnificent Iconography of Orchids, are figures of *Eulophiella Elisabethæ*, an interesting plant with the general habit of a *Catasetum* or of a *Eulophia*, but which, from the peculiar structure of the flower, is considered the type of a new genus. The stout pseudo-bulbs produce four lanceolate leaves attenuated below into slender petioles and nearly two feet in length with prominent veins. From the base of the pseudo-bulb the scape rises to the height of nearly a foot, and like the fleshy concave bracts and pedicels is a deep vinous purple, making a handsome contrast with the white flowers with broad spreading segments, which form a nearly complete circle. The generic name of this interesting plant serves to indicate the resemblance to *Eulophia* and also the presence of the peculiar conspicuous crest. The species is dedicated to Queen Elizabeth of Roumania, and was introduced by the Horticulture Internationale of Brussels, where it has recently flowered. The native country is not divulged, although we are told it should be grown in a warm house and that it will succeed under the treatment needed for *Phajus*, *Eulophia* and *Cyrtopodium*.

There are also figured in this issue *Phajus tuberosus*, a beautiful Madagascar species, which in recent years has excited the admiration of Orchid-growers; *Cypripedium exul*, var. *Ilshootianum*, a plant at first supposed to be a variety of *Cypripedium insigne*, to which it bears, in the general form and color of the flowers, a remarkable resemblance, although it differs from that species in its erect, not spreading, leaves; and *Peristeria Lindeni*, a remarkable and striking species with short racemes of almost globular flowers with light green sepals and petals suffused with dull purple, and covered throughout with deep dark purple spots, the lip being margined and striated underneath with the same color on a pale ground. This very striking and interesting plant is a native of tropical America, whence it was introduced by the Messrs. Linden.

New or Little-known Plants.

Hypericum opacum.

AMONG the American *Hypericums* are several species which commend themselves to the attention of gardeners. The species are all dwarf shrubs with deciduous leaves, and produce an abundance of showy yellow flowers from midsummer to early autumn—that is: at a time of the year when few shrubs are in flower.

We have, from time to time, published portraits of several species, which, curiously enough, are little known except to professional botanists, and in the present issue another species is figured (page 305). It is the *Hypericum opacum* of Gray, a southern plant, with a range from South Carolina to Tennessee and to Florida and Mississippi, and produces erect slender stems one to four feet high, covered with light red exfoliating bark and corymbosely branched toward the summit. The leaves are closely sessile, linear-oblong, obtuse, pellucid punctate with crowded dots; an inch or an inch and a half long and a quarter of an inch broad. The flowers, which appear in nearly naked divaricate cymes, are rather less than half an inch in diameter. The seed-pod is ovate and a quarter of an inch long, and the seeds are oblong and minutely pitted.

Hypericum opacum is less hardy at the north than many of the other species; it will, of course, flourish in the gardens of the southern states, and may be expected to thrive as far north as the neighborhood of this city. C. S. S.

Foreign Correspondence.

Knap Hill Nursery.

THIS nursery is famous the world over for its Rhododendrons and hardy Azaleas, and Mr. Anthony Waterer, its venerable proprietor, is one of England's most noted gardeners. To see the Rhododendrons and allied plants in the Knap Hill nursery in June, with Mr. Waterer for a guide, is to enjoy one of the most magnificent floral displays it is possible to conceive, and to hear a great deal of exceptionally interesting information about them. “The Knap Hill nursery is the most extensive, as it is the oldest, establishment in England in which the cultivation of American plants has been made a specialty. Its extent exceeds 200 acres, of which more than 60 acres are allotted to the cultivation of American plants. The beds and borders devoted to this class of plant extend over miles in length and contain the largest quantity of the finest plants to be met with in this country or in Europe.” This is word for word what Mr. Waterer says in his plant catalogue, and it is a modest enough description to any one who has seen Knap Hill. The nursery is well situated in regard to soil and water, and the position, though bleak, is fortunate in the surrounding scenery, which is of the delightful Surrey hills and dales. Running straight through the nursery there is a very long carriage-drive connecting two public roads, and this drive Mr. Waterer generously permits the public to use, with certain reservations as to dogs, etc. Thousands of people go every year to Knap Hill to see the wonderful display made by the Rhododendrons and Azaleas. Whit-Monday is quite a gala day, the crowd being so great that the workmen of the nursery have to act as patrols to keep the visitors in order. To understand all this one must see the plants for himself. I had no idea that the display was so magnificent, and I do not expect to succeed in conveying to others anything like a fair idea of this wonderful collection of outdoor plants. There are masses of Rhododendrons, Azaleas and other similar plants in other nurseries, in public gardens and parks, and in private establishments, but they are insignificant when compared with the Knap Hill collection. Of course, when it is remembered that these plants have been a specialty in this nursery for more than a century, that the best varieties have nearly all been raised there, and that the Waterers have always been

what is called *Rhododendron mad*, the extent and interest of the collection are to some degree accounted for. Mr. Waterer is a conscientious breeder; he will have nothing to do with plants of inferior quality. "I like a *Rhododendron* or *Azalea* flower to look me in the face, to spread out its petals, and to pack in the truss so that it never flops about in rain or wind. It must have good leaves too, be fit to look at when out of flower, and be absolutely hardy. We

Mr. Waterer has annually large exhibitions of *Rhododendrons* in the gardens of the Royal Botanical Society at Regent's Park, and in Hyde Park near Rotten Row. These latter I saw a few days ago, and exceedingly attractive they were. Some of the specimens were enormous, one of the rich blood-red flowered *Michael Waterer* being a truly wonderful picture. It was nine feet by nine feet, and literally crowded from top to bottom with huge trusses of flowers which almost dazzled the eye. But there are better things than this even to be described in the nursery.

The *Azaleas* are grown in hundreds of thousands, from young plants flowering for the first time to huge specimens almost as large as a haystack. Colors of every shade, from white to orange and crimson, some variegated, some self-colored, some of dazzling brilliancy, others delicate, but all lovely. Flowers as large as those of *Azalea Indica* were plentiful among the more recent seedlings. Later-flowering varieties than the old *Calendulacea* family have been raised chiefly from *A. occidentalis*, and are being rapidly propagated by Mr. Waterer. They flower fully three weeks later than the older kinds. The parent of all Mr. Waterer's red-flowered seedlings is what he calls *A. coccinea*; really, I suppose, a form of *A. calendulacea* with deep red flowers. There are several magnificent bushes, the originals of this variety, at Knap Hill. None of these *Azaleas* are grafted; they are mostly raised from layers or seeds. Many of the colors appear to come fairly true from seeds. In England, at any rate, we do not use these grand *Azaleas* nearly as extensively in gardens as they should be used. If Mr. Waterer had done nothing else, his work in improving and diversifying the American *Azaleas* would certainly prove a lasting monument to him.

A. Sinensis (mollis) is also receiving special attention at Knap Hill. As a flowering plant it is as fine as the very best of the American kinds, and in England, at any rate, it is perfectly hardy. Already Mr. Waterer has obtained varieties with blood-red flowers. I consider this *Azalea* one of the very best garden-plants in the genus. Very queer, yet promising, crosses have been made at Knap Hill, of which, however, I may not say more than that they are likely to add to the fame of the Knap Hill establishment.

The *Rhododendrons* take one's breath away. Is there any genus in the whole vegetable kingdom to which gardens are so much indebted as to *Rhododendrons*? Outside, in the greenhouse, the intermediate house, and even in the stove, we have them, and they are almost every one beautiful. But if this is true with regard to species, what might one say of the hundreds of splendid crosses which we now possess? I was ignorant of the endless variety of color, beauty of form

and grand character generally of the hardy *Rhododendrons* until I saw them the other day at Knap Hill. Almost every color, even to blue and almost to black, is represented. But to see what these plants are capable of, one must behold them when grown into huge bushes and covered with trusses of flowers. Of course, the soil at Knap Hill exactly suits *Rhododendrons*; the plants there attain a perfection which it is hopeless to expect in less



Fig. 54.—*Hypericum opacum*.—See page 304.

send no plants out of this nursery that do not fulfill these requirements." When asked what kinds did best in colder regions, for instance, in the northern states of America, Mr. Waterer replied that he bred only from *R. Catawbiense* for America, and that he would never recommend the tenderer sorts for that country. But, he exclaimed, "they know all about my *Rhododendrons* and *Azaleas* too, for we send thousands to the Americans every year."

suitable soils or within range of the smoke of large towns. But these plants are not dear, even if one has to renew them every few years. We do not hesitate to spend fifty pounds in the purchase of Tulips and Hyacinths for a week or two's display in spring, and this sum laid out in Rhododendrons would produce something at least equally as attractive and lasting. But, as Mr. Waterer says, Rhododendrons and Azaleas will succeed in almost any soil that does not contain lime or chalk, and in many sandy loams they grow with as much vigor and luxuriance as they do in peat.

I set down the names of the Rhododendrons which I saw and thought excellent. They were as follows: White, Rosalie Seidel, Sappho, Mrs. S. Simpson, Mrs. J. Clutton, The Queen; rose or lilac, Everestiana, Marchioness of Lansdowne, Lady C. Mitford, Alexander Dancer, Lady Grey Egerton, Stella; scarlet, J. Mackintosh, Mrs. Shuttleworth, E. S. Rand, M. H. Sutton, Doncaster, J. M. Brooks; crimson or purple, Cetewayo, Melton, G. Paul, John Walter, Sigismund Rucker, Michael Waterer, *Purpureum grandiflorum*, King of the Purples, C. S. Sargent, Sir Hugo. These are all sterling sorts, such as I would like to plant in quantity in a garden for myself. In a nursery where bad or inferior varieties are not cultivated it is almost superfluous to make selections. To stand on an elevation at one end of the nursery and look over the whole extent of Rhododendrons is to see the full splendor of these plants, a splendor which, in my opinion, is unequaled even by the Rose.

The propagation of Rhododendrons is partly from layers and partly by grafting, the former, although slower, being preferred by Mr. Waterer on account of the suckers which grafted plants are almost certain to develop to the injury and even destruction of the cion. The renovation of sickly or worn-out specimens by cutting them in hard, and sometime by grafting better sorts upon them, was described and shown to us by the young Mr. Anthony Waterer, who is as keen a grower and admirer of American plants as his father.

In June everything at Knap Hill is eclipsed by the Rhododendrons and Azaleas, but if one can afford the time an inspection of the other plants in the nursery is of more than ordinary interest. Nothing but what is good, and almost everything in fine health and form among Coniferæ, forest-trees, ornamental trees and shrubs, and even herbaceous plants may be seen here as one rarely sees them. I noted variegated Turkey Oak, Double White Thorn, Weeping Thorn, *Adrus atlantica glauca*, a beautiful *Laburnum* called Waterer's, remarkable for length of raceme and color; a huge tree of the Golden-yellow Chestnut; another of the Crested Beech, and one of the evergreen *F. antarctica*; a Weeping Beech, thirty feet by sixty feet, which is said to be only about sixty years old, and is one of the most wonderful trees in the nursery. Thousands of the Blue Spruce (*Picea pungens glauca*), of Golden Yews, Cypresses, and many other conifers; *Acer Worleyi*, with rich bronzy leaves; *Alnus Van Houttei*, yellow; a fine deep-colored red Horse-chestnut, called *Æsculus rubicunda rosea Brioti*; the silvery *Pyrus sorbus*, var. *lutescens*; grand forms of *Cydonia Japonica*; Weeping Purple Beeches, and very fine Hollies. I might run through almost the whole of the numerous plants enumerated in Mr. Waterer's catalogue, and state that all were first-rate. A form of *Spiræa Bumalda*, called the Knap Hill Scarlet, is one of Mr. Waterer's new plants with a promising future. It has scarlet flowers in large compact heads, and blooms from July until destroyed by frost. Old, and in some cases unique, specimens of many trees are scattered about over the nursery, and impart to the place an appearance unusual in trade establishments. The preparation of the plants for removal is done systematically and thoroughly, so that large specimens can be transferred to other gardens without much danger of failure. Some of the best of our newer gardens have been planted with material supplied from Knap Hill. The garden at Waddesdon Manor, the residence of Baron

F. de Rothschild, considered by competent judges one of the best gardens in England, was stocked principally by Mr. Waterer.

London.

Visitor.

Cultural Department.

Iron-clad Stocks—The Graft-box Fungus.

I AM much pleased to find that my proposal to employ iron-clad seedlings as stocks for budding or grafting tree-fruits for the cold north meets with the endorsement of Professor Budd, of the Iowa Agricultural College, who has made a special study of the best methods of propagating fruit-trees in the north-west, and who is a well-known experimenter with the so-called Russian varieties of fruit-trees. Referring to my remarks on this topic in a recent issue of GARDEN AND FOREST, Professor Budd says in *Rural Life*: "Beyond all doubt budded Apple-trees on hardy roots would prove more valuable than our ordinary piece-root grafts. In practice it would also be a source of gain to the nurseryman. Budded trees, when two years old, are larger and smoother than root-grafts three years old, and the number of culls among budded trees would be small—not one-tenth the number found among piece-root grafts where third cuts are used."

While defending piece-root grafting from what seemed to me unreasonable criticism, I have always opposed the use of third cuts, or even second cuts from small roots. But I shall hail with joy the laying away of this controversy by the adoption of a class of stocks which will allow of budding the iron-clads in place of grafting them. Heretofore this has been impracticable, because it brings the stock above ground, and unless the iron-clads budded on common stocks are planted out in the orchard so deeply as to well cover the point of union, the young trees are no hardier than their stocks.

In order, however, to obtain iron-clad seedlings fit for budding valuable market fruit must be used at a loss unless it is evaporated and the seed saved from the cores; and even this makes much more work in extracting the seed from the cores, compared with ordinary cider-mill seed. But at a dollar or two per pound such seed will be cheap for all nurserymen who are growing budded stock for planting where the thermometer goes down into the minus thirties and lower nearly every winter.

On the subject of the "graft-box fungus" Professor Budd advises keeping the grafts in a low temperature, even considerably below freezing; and a long experience has taught me that grafts so kept winter in fine condition, and grow strongly when planted out. So particular have I been about this matter that when I have had root-grafting done by others I have insisted that the grafts be made early in the winter, and sent to me as soon as made. A single neglect of this rule cost me the loss of a considerable lot of grafts of one of the new Russian Pears. When received from the grafter, early in April, they were nearly all started. Though very carefully put out, only a few grew, and of these none made a satisfactory growth or became merchantable.

The chief difficulty in wintering root-grafts, aside from temperature, arises from variations in the moisture of the packing. When fine sawdust direct from the green log is used, carefully packing it about and between the bundles of grafts, containing not more than one hundred each, the boxes closely covered and kept in a freezing temperature, the grafts will afterward be found in perfect order, and no sign of the fungus makes its appearance. This statement is based on an experience of more than twenty-five years. On the other hand, if the grafting is carelessly done, with unnecessary exposure of stock and cion to heating and drying influences, and then the completed grafts, in large open bundles, are packed loosely in a mixture of chopped straw and wet sawdust, and kept in an even moderately warm cellar, either the grafts will be attacked by the fungus, or they will become too dry, or their buds will swell and grow—any one of which occurrences is fatal to that vitality upon which, with careful planting, we must depend for a stand of marketable young nursery trees. On light soils particularly, but also on any soil suitable to the purpose, a vigorous growth of the grafts depends largely upon deep, careful and firm planting. One good bud above the surface is better than more. The soil should have been several years in tillage, deeply plowed, and abundantly and evenly enriched from the surface downward. In this way we get very fine trees from carefully made, kept, and planted root-grafts. But with good iron-clad stocks, still better results may be attained by budding.

Newport, Vt.

T. H. Hoskins.

Choice Herbaceous Plants.

ST. BRUNO'S LILY, *Anthericum liliastrum*, is not only perfectly hardy in this locality, but it grows freely and produces an abundance of snowy white lily-like flowers. It is a first-class ornamental and useful plant, and deserves to be more generally grown. Perhaps one reason why it is not seen oftener is that those who grow it usually have but one specimen, and in this way it is never so effective as when grown in

masses. This *Anthericum* is a native of the Alpine meadows of the south of Europe, and has been in cultivation since 1629. It grows about twenty inches high, and its leaves are about twelve inches long. The white flowers are fragrant, two inches long and about one and a half across, and on the point of each of the petals there is a small green spot. The flowers are produced in loose spikes, each spike bearing from six to twelve flowers. The variety of this plant called Major very closely resembles the type, but it is a stronger grower and has



Fig. 55.—The Great Elm at Derby Line, Vermont.—See page 303.

masses. To insure a good effect requires a clump at least two or three feet in diameter. A few days ago I saw such a group at a nursery near here, and the flowers showed to great advantage above the abundant foliage. The plants thrive best in a deep rich soil, and they are not particular whether they are placed in a partially shaded position or in full sun. I find that the plants somewhat shaded come into flower a little later than those which receive the full benefit of the sun. If we have plants both in sun and in shade a longer season is in-

larger flowers, which are produced in profusion, and are very useful for cutting purposes. Both type and variety are propagated by division of the roots in the fall, or by seeds, which should be sown soon after they are collected. This plant is also known under the name *Paradasia Liliastrum*.

The genus *Heuchera* is a small one, consisting of about twenty species of hardy perennials, and belongs to the Saxifraga family. They are all natives of temperate North America. The flowers of most of the species are neither showy nor orna-

mental, but they form compact tufts of foliage, which are rather pretty, and can be used to advantage under taller-growing subjects. *Heuchera sanguinea* is the best plant of the genus, and it has come to be ranked as one of our best perennials. It is a robust grower, perfectly hardy, and does not require any special treatment, growing freely either in the herbaceous border or in the rock-garden. When it is planted in a mass it gives a splendid effect. It is comparatively new, having been introduced into gardens from Mexico in 1882. It has a neat bushy habit, forming compact tufts of leaves close to the ground. The graceful flower-stems are produced abundantly, and are covered with deep red tubular flowers, which last for several weeks. The leaves are light green, slightly hairy, cordate, five to seven lobed, and these are again sharply crenated. It is easily increased from seed or by division of the crowns in spring.

The Alpine Aster (*Aster Alpinus*) has large bright purple flowers which are much admired. It is a neat and beautiful plant, growing from nine to twelve inches high. The flowers are produced singly on the stem and are about two inches across. This Aster is a very old inhabitant of gardens, having been in cultivation for over two centuries; and yet in some of our best collections of hardy plants it is not seen. It is not hard to grow if placed in good garden-soil where it can have plenty of light. It is an excellent plant for the rock-garden or the front row of the herbaceous border. After the flowering season it may be increased by division of the strong roots or by seed.

Several of the species of *Campanula* are just now conspicuous in the borders. *Campanula persicifolia*, with its large blue flowers, is very showy and making quite a feature where there are large masses planted. There are several varieties of this plant, such as *Alba*, *Maxima* and the double white, and all of them are good garden-plants. *Campanula glomerata* *Daurica* is a good plant, flowering annually with great profusion, and demanding little care or attention. It was brought from Siberia in 1825, and was thought then to be a new species, but was afterward reduced to the rank of a variety. It grows from fifteen to eighteen inches high and has large deep purple flowers, produced in dense heads. All these species and varieties are easily cultivated; they do well in a good, rich, open soil, and are increased by division of the plants either in the fall or spring.

Centranthus ruber is an old favorite and is covered just now with its red flowers. It belongs to the Valerian family and is sometimes called the Red Valerian. It is a native of the south of Europe and is naturalized in Great Britain. The plant attains a height of two feet here and is a little shrubby at the base of the stem. The individual flowers are very small, but they are produced in dense cymes forming a handsome corymbose panicle, and are very useful when cut, as they last for several days. There is a white variety of this plant which is quite pretty but does not come into flower as early as the species. This plant will grow in any sort of soil, but to get the largest and brightest flowers it needs a little manure. It is most readily propagated in the fall by division of the roots, great care being taken to preserve the long fleshy roots and to break or bruise them as little as possible.

The perennial *Spiræas* are just now among the best ornaments of the herbaceous border. *Spiræa Aruncus* is one of the tallest and most showy, growing to a height of four feet. Its habit and foliage are good, and its small white flowers are borne very freely on long spikes, forming a terminal panicle. It does well in the border or wild garden associated with the more vigorous perennials; but it requires to be planted in deep moist loam. It is a native plant, but is also found in Europe and Asia.

S. astilboides is another handsome perennial which is rather like *S. Aruncus*, but is much more dwarf and graceful. It grows about two feet high and its stems are furnished with triternate leaves and terminated by spicate panicles of white flowers. As a border or rock-garden plant it is unrivaled among the dwarf *Spiræas*. It is also very useful for forcing in spring, making a good pot-plant, growing freely and flowering profusely. It is a comparatively new plant and was brought from Japan a few years ago. The Dropwort or *Spiræa filipendula* is a European species and received its common name on account of its small tuberous roots hanging like drops by slender threads. There is a double form of this plant which is more common in gardens than the species. The flower-stems are about two feet long and all in loose panicles; the flowers are white and are very useful for cutting. The foliage is very pretty and fern-like; it is mostly radical on the lower part of the stems. It is a good border-plant. It is very pretty in our rock-garden, where it is planted in a high and open po-

sition, so that its large panicles of double white flowers show to great advantage. All the herbaceous *Spiræas* are easily multiplied by division of the plants.

Cambridge, Mass.

Robert Cameron.

Fern Notes.

COMPARATIVELY few noteworthy Ferns have been introduced during the past year or two, and most of these are in the line of variations of well-known types. Some, however, prove to be decided improvements, and as such are worthy of more extended cultivation; among these is still another form of the old Ribbon Fern (*Pteris serrulata*), known as *P. serrulata cristata densa*, an unfortunately long title for so pretty a Fern. This variety is in the style of *P. serrulata Dixonii*, but is more compact and profusely crested, the fronds being gracefully arched and of light green color. It will no doubt prove a useful plant for small ferneries, and as the various forms of this species are among the easiest to propagate, a stock may readily be secured.

Pteris Cretica Mayii is not new, though it is not very common; it presents some of the well-known characteristics of the type in its hardy nature and tough foliage. It also is compact in growth, the fronds being short and the pinnæ more or less forked and crested, their color being dark green, with a slight variegation of lighter color down the centre of each division. *Pteris Cretica nobilis*, also a good form, does not produce as many spores as do some other varieties of this class, and has, therefore, not as yet become so popular a plant as was anticipated, though unquestionably a very serviceable variety.

Some of the newer forms of *P. tremula* become very attractive plants when carefully grown, and either for conservatory decoration or for exhibition purposes have much value. *P. tremula Smithii* is one of the best, and the fronds are finely divided and much crested on the tips of all the segments. This variety is, I think, more graceful in habit than *P. tremula grandiceps*, an earlier crested form of this species, already described in GARDEN AND FOREST.

The *Adiantums* also continue to produce cristate forms, among those of recent introduction being one of *A. assimile*, the fronds of which are tipped somewhat like those of *A. cuneatum grandiceps*, and, like that variety, have an effect both curious and graceful. This form of *A. assimile* will probably make a useful basket Fern, the type being specially adapted to that method of cultivation.

Pteris Victoriae is certainly one of the prettiest Ferns of recent introduction. The variegation of its slender fronds is clear and distinct in its markings, while the habit of the plant is neat and graceful. The growth of this species is moderate, and it is well suited for small collections. It enjoys more heat than many other members of the genus, doing well in a temperature of sixty to sixty-five degrees. This is the Fern discovered by Mr. Forstermann in a warm locality in the South Pacific islands during one of his Orchid-collecting tours.

Gleichenia dicarpa longipinnata is one of the most beautiful Ferns, and deserves a place wherever the proper facilities for the growth of these plants exist. It is not new, but as the *Gleichenias* are usually propagated by division of the rhizomes, their multiplication is naturally slow, and special forms continue somewhat rare. This variety has very long fronds and small pinnæ, and makes a most attractive specimen, but, like nearly all its fellows, *G. dicarpa longipinnata* thrives best in a moderately cool house.

G. rupestris glaucescens is another useful form, and, like *G. dicarpa longipinnata*, is of scandent growth, but has much coarser fronds of light green color, and is quite glaucous beneath. It bears some resemblance to *G. Speluncæ*, but is not so strong a grower, and will flourish with more heat. *G. dicarpa* frequently bears spores, from which I have sometimes succeeded in raising seedlings, but I have never seen spores on *G. Speluncæ*.

Holmesburg, Pa.

W. H. Taplin.

Narcissus poeticus.

THE Rev. G. H. Engleheart, in writing to the *Gardeners' Magazine* of *Narcissus poeticus*, which brings the Daffodil season to a close, calls attention to the great length of that season. The little Hoop-petticoat *Narcissus* will flower in England under glass in February, and such precocious kinds as the Golden Spur and Tenby, under the shelter of a south wall, will begin to bloom in the middle of March, while June will find the last of the Daffodils, the Double Poeticus, in bloom. The Pheasant's-eye Daffodil,

or Poet's Narcissus, is cultivated in England by the million in the open ground, especially the early-flowering form, *Ornatus*, but, well known as it is, it has been strangely neglected by hybridizers. It has been crossed with the Trumpet Daffodils, and the result is apparent in the numberless short-crowned flowers of the *Incomparabilis* section, but there has been little attempt to enhance the best features of the Poet's Narcissus, as has been done with the Trumpet Daffodils, by intercrossing and selecting seedlings. Just as that splendid plant, the Emperor, is probably only an improved form of the old Narcissus *Rugilobus*, or *R. lorifolius*, so a more robust and floriferous race of Poet's Narcissus with red eyes might be secured, and, indeed, has been secured by Mr. Engleheart. He has also obtained flowers with the shapeliness and precocity of the *Ornatus* varieties, but much increased in size, besides crosses between *Ornatus* and the late *Recurvus*, which unite in the same flower the brilliant whiteness and solidity of the latter with the flatly expanded form of the former. But there is abundant room for other workers, and this field is more promising than any other in Narcissus culture, because every seedling of *N. poeticus* has a vigor, a constitution, if it has no other good quality. Of the cultivation of the Pheasant's-eye Daffodils, Mr. Engleheart says:

In the cultivation of the Pheasant's-eye there are three points which should be kept in mind. First, its great inherent vigor enables the plant to thrive in a much richer soil than is wholesome for most other Daffodils. Broadly speaking, no amount of manure will injure either blossom or bulb. To those who have the common variety, *Recurvus*, or late single Pheasant's-eye, in their gardens, but grown as it usually is—namely, left alone for years in a half-starved condition in a mixed border—I recommend planting a batch of bulbs in a slip of deeply-dug and heavily manured kitchen-garden ground, and lifting and replanting annually in similar quarters. The change of the flower in dimensions and substance will astonish them; indeed, it becomes a different thing altogether. The second point is that all the Pheasant's-eyes require for their well-being more moisture at their roots than other Daffodils. Therefore, on dry soils it is advisable to give them the moistest corner of the garden, and to take out no sunk alleys between the beds which contain them. Thirdly, and perhaps more important, the Pheasant's-eye ceases from growth for scarcely a week in the year, and cannot be said to have a resting-time for its bulbs. If there comes a dry hot spell of weather while it is in bloom, and heavy rain follows, it will commonly make long fresh roots before the leaves show signs of decay. In any case the bulbs will be found to have started into growth before the end of July. Accordingly, the variety *Ornatus* should be lifted in June, and the later variety of *Poeticus* as soon as the foliage turns yellow at the tips—not waiting for its more entire decay. And I advise that *Ornatus* be replanted before any other Daffodil. It is difficult to injure this robust plant seriously by any treatment, but for the best results let it be planted early.

With regard to existing kinds of *Narcissus poeticus*, the three best for ordinary purposes of cut bloom are *Ornatus*, *Recurvus* and the double *Gardenia*-flowered. A fourth, *N. poetarum*, is beautiful with its wholly red eye, but in many soils it is certainly not so robust as the others, nor nearly as floriferous as *Ornatus*, which blooms from quite small offsets, while *N. poetarum* blooms only from mature bulbs. The double kind is extremely beautiful when well grown, and most useful in filling a gap between spring and summer flowers. But it has the serious defect of producing a large proportion of empty or "blind" spathes. Many explanations have been given of this habit, and remedies propounded, but I believe no one has been able to conquer it. My own notion is that the plant has exceptional requirements in the way of abundant root-moisture, but that it demands also ample sun-heat at the same time to ripen its growth. This conjunction of conditions is not easily obtained, but it may be said that in open quarters, which have been deeply trenched and liberally manured at the bottom, there will be fewer blind spathes than on shallow hot soils.

Those who grow large collections of Daffodils may include some other Pheasant's-eyes in addition to the above-mentioned. *Angustifolius*, a slender-growing kind with narrow petals, is in most respects quite inferior to *Ornatus*, with which it blooms, but it possesses a singularly sweet and refined scent, approaching that of Sandal-wood. *Grandiflorus* is very large and striking, but increases so slowly that it is difficult to accumulate a stock. *Patellaris*, or the flat-crowned Pheasant's-eye,

is in all probability the single form of the well-known double *Poeticus*. It is the common wild *Poeticus* of the neighborhood of Montreux and other continental localities. *N. poeticus verus* of Linnæus, as it is called in catalogues, is a most beautiful kind, small in blossom, but with a circular flower of solid and overlapping petals. I consider it a most valuable kind for the hybridist, as likely to infuse substance and good shape into some of the larger sorts. Then there are small mountain varieties which are found in Italy, both north and south. That which has been catalogued as *Verbanus*, or *Verbanensis*, and takes this title from the Latin name of Lago Maggiore, is so abundant on some north Italian mountain-pastures that I have seen acres of it in one sheet, mingled with the blue *Gentianella*. It grows but a few inches in height, and seems to resent ordinary garden cultivation, but will live on the rockery or in grass.

Correspondence.

Impressions of America.—II.

To the Editor of GARDEN AND FOREST:

Sir,—Spring found me in one of the loveliest suburbs of Boston, bent on enjoyment of nature and study of this garden problem that exercises such a curious fascination on all who have once come under the charm. Houses and statues, books and pictures are all very well in their way, but their way is often a wearisome one. The conscientious art-critic, for example, is too often doomed to pass hours in the foul air of crowded rooms examining pictures by the hundred which ought never to have been painted. The garden-critic, on the other hand, has at least the solace of fresh air, and if he does sometimes feel that the flowers and shrubs he sees ought never to have been planted in that combination, flowers and shrubs are a good deal easier to re-arrange mentally than pigments. This re-arranging, indeed, gives a great part of the pleasure. If you cannot have really beautiful gardens with passages which at once stir the imagination into joyous activity by the sight of a broad, rolling, tree-flecked stretch of grass, with glimpses of a gleaming lake beyond set off by masses of *Rhododendrons*, just visible through a depression in the bluffs that hem in the water; or of English roseries, where music seems to float in the fragrance they exhale, and poetry is made visible in the grace and tenderness of their manifold forms; or of arching trellises, suggesting twilight meditation; or of such enchanting floral groups as are made when Tiger Lilies uplift their torches beside tall Irises robed in deep purple—if you cannot have pleasures such as these, at least you see floral beauty, even though it be misplaced, and your imagination will be kindled by the very mistakes and shortcomings you see. It is all so delightfully easy. Your imagination takes fire at the sight of a noble Lilac-bush crushed up against some coarse foliage in a stupid shrubbery, or a round bed of ill-assorted Geraniums lost in the grass, or a flat bed of nondescript color, from "assorted packets" of seed, at the foot of the piazza, or, perhaps, scraggly bands or beds of Tulips in the most trying combinations. You set to work at once setting the Lilac-bush free and making it grow full and round, as nature meant it, taking the Geraniums out of the bed, selecting one or two well-balanced tints of Pansies from among the "assorted" flowers, and filling the bed with them, while the Geraniums are variously distributed; the bright and scarlet and the frozen red ones are separated, put in with Ferns and Lilies-of-the-valley at the kitchen-door; the drooping specimens among the crimson-pink or white ones are planted with deep blue Lobelias and Ferns or Grasses in large pots or tubs, and put on the piazza-balustrade or placed as sentinels on either side of the front steps; the more upright Geraniums are used as a kind of support or setting to the house in the front border, along with Palms and *Dracænas* and other house-plants that want a summer outing, or among some of the perennials that have the right height and character. As for the Tulips, not one of the discordant ones is allowed to remain. It is all so delightfully easy—so much easier, indeed, to study it all out than to do it actually, and then have no end of care in the apparently simple task of keeping all intrusive tints away. Neither bulbs nor roots nor seeds are kind enough to wear the exact shade of red or purple or pink that their flowers put on in summer. It is the business of head-gardeners and nurserymen to know, though, and to provide their roots or seeds with unambiguous names, referring to a chart of colors, if one can be had, which will prevent their subordinates or customers from making painful mistakes.

The true garden-critic, however, is not hampered by any considerations such as these when in the full swing of re-

constructive fancy. Things grow and arrange themselves at his bidding, and out of a poor little suburban garden, struggling with dust and drought and want of pennies to spend on gardening, he creates a little bower of beauty. And, seriously, I do not think he is altogether so fantastic and unpractical as many people would make him out to be. Take the garden just alluded to, for instance. I admit that Lilac-bushes do not grow into the right shape in a night simply by being set free from contracted surroundings. But in most cases they will correct their own shape in time, and in gardening, as in other things, promise is often as pure a source of joy as fulfillment. You will observe that the other suggestions I made did not entail the laying of a single new bed, except one near the kitchen-door, and a bed of Lilies-of-the-valley and Ferns is not an expensive one. If you do not care to have that bed, you can always find some place to put the rejected Geraniums where their colors do not clash with those of other flowers. It is only a trifle more expensive to buy seeds—for the round bed—of one or two choice varieties of the same flower than it is to buy "assorted" packets. The bed running along the piazza can be managed by degrees. If you get one or two salient points to begin with—say the angles of the steps—the remainder will not disturb you so much, and you can go on gradually, getting nearer and nearer to your ideal till your bed comes fairly up to it, and you can turn your attention elsewhere. There are several cheap ways of filling such a bed as the one we are discussing, if you feel that you would like to keep it, and, by degrees, make it into an appropriate setting for the house to stand in. These beds are not so much the fashion now, and many people seem to hide their flowers carefully out of the way if they have any at all, and yet this flowery setting to the house may be easily made to have a consistent character and pleasing effect. There are many ways of keeping up this character; the one suggested above, of an artistic grouping of indoor plants that are kept over for next winter's use on either side of the piazza-steps, is quite effective, and might be made, with some knack in the grouping, to combine gracefully with the beginning of a herbaceous border. If there are no indoor plants available, and a herbaceous border is what you care most for, some of the perennials might be made to take their place, but, whatever you choose to have, do not let it look as if the piazza-steps were an accident cutting the flower-bed into two disjointed halves; let the flower-bed lead up to, and accentuate, the steps. This, again, can be done in many ways—everything can be done well in more ways than one, if you once set about looking for them. Again, if a herbaceous border be what you are aiming for, there is no reason for trying to convert the whole of the bed along the piazza into a herbaceous border at once; it can be planted bit by bit, filling in the ends with some such things as Mignonette or Poppies. The Mignonette would require a row of Nasturtiums or Scarlet Runners at the back to bind house and border together, and also some kind of a boundary line of Ferns or low Nasturtiums between them and the more elaborate arrangement near the piazza-steps. Either Mignonette or Poppies would allow of a border of Daffodils to make the house look bright in the spring-time.

As for the Tulips, the best plan is to start by buying the right ones; but, in any case, obnoxious ones can be weeded out either by making a little color chart when they are in full bloom, and marking the bulbs accordingly, or simply by tying something to the displeasing ones and discarding the bulbs when they are lifted. All this work of reconstruction is easier to plan than to accomplish, and yet it is much more satisfactory than criticising pictures, for you can continue at this for years and know nothing of art or beauty either. But you cannot begin criticising gardens without learning certain broad lessons in gardening, such as, for instance, that Hollyhocks do not bloom in the spring, and that different plants, in order to look well, must have different surroundings. From this it is only a step to begin to put your theories into practice, and it is this practice of gardening that deserves to be much more widely spread than it is. Gardening in America seems to me a luxury for the wealthy only, and there appears no good reason why this should be so. My first impressions of America in autumn had left me with a vague sense of perplexity at the inconsistency between the glorious woods and the uncared-for front-yards; my spring impressions only served to increase this perplexity. In a country where so much might be done, it is sad to see how comparatively little is done; how few of the residents in these Boston suburbs that I have had an opportunity of observing seem to appreciate the inestimable blessings of gardening as a fine art.

Milton, Mass.

Cealia Waern.

Is Spraying Overdone?

To the Editor of GARDEN AND FOREST:

Sir,—If Dr. Hoskins' opinion (p. 261) is correct,—“that we are doing more spraying in our orchards now than we shall do ten years hence,”—then it must follow that the work of our experimenters and the conclusions of orchard-owners are alike well-nigh valueless, for probably not one orchard-owner in fifty now sprays his trees. In comparatively few communities has spraying yet become sufficiently popular to exert any marked effect upon the fruit-markets, especially of the tree-fruits. Any diminution of this practice must reduce the value of the operation, so far as markets are concerned, to an insignificant margin. My own opinion is decidedly opposed to that of Dr. Hoskins. I am convinced that ten years hence three times more spraying will be done than now; and my faith rests less upon the present work of experimenters than upon the fact that very many of our most acute fruit-growers are ardent champions of spraying. I know of no recent practice in agricultural directions which finds so many earnest advocates among the best farmers as this; and this fact is indisputable proof of the excellence of the operation.

I am willing, and, in fact, anxious, to admit that much indiscriminate spraying is being done, and that some growers will be inclined to discontinue it; but this fact only brings out the more clearly the benefits which result from proper methods. It is also true that some of our insect and fungus invaders are occasionally our friends, but they are most unreliable friends. I cannot trust the codlin-moth to thin my apples; sometimes it thins them until none are left, and sometimes not enough. And if I breed a healthy crop of insects in the year when my fruit is abundant, I am afraid that I shall have too many of these helpers the coming year when my crop may be small. The codlin-moth and apple-scab are expensive allies. The only real benefit which I can get from them is the consolation that they will often ruin the crop of my neighbor who does not spray, and thereby leave the better market for myself who do spray!

It would certainly be effective treatment to “uproot every variety” of Apple which is subject to apple-scab, for then, in western New York, at least, we should have no market apples left, and we should have no occasion for spraying! But we cannot expect to convince our orchardists that it is wise to uproot the Baldwin orchards; they will at once answer that it is cheaper to spray. I own that we should attempt to produce scab-proof varieties, and Dr. Hoskins makes a good point in calling attention to the fact, but until we obtain them we must content ourselves with present varieties and carbonate of copper. We have no proof whatever that crosses with scab-proof varieties will give scab-proof offspring; and the means of obtaining such varieties are not yet known. There are, to be sure, many present varieties which are little affected by scab, but, unfortunately, most of them are not profitable market sorts.

We shall, no doubt, greatly cheapen and simplify the methods of spraying, but the practice, as a whole, is, in my opinion, one of the distinct advancements of modern times in agricultural and horticultural practice.

Cornell University.

L. H. Bailey.

A Good Example.

To the Editor of GARDEN AND FOREST:

Sir,—Last year the attention of your readers was called to the making of a semi-public water and wild garden by Mr. S. C. Nash at Clifton, New Jersey. It will be remembered that this had only recently been a swampy, worthless piece of ground, occupying a depression stretching along the public highway. The hollow had been fed by abundant springs, and nature had full sway for years to establish the various indigenous weeds, which, with the attendant animal life, make such places eyesores when near frequented roads, whose dust adds the last touch of desolation. Such places are only too frequent, and the attempt to convert such a waste into an orderly garden in keeping with the natural conditions of the situation seems so interesting that some report of the progress made may probably be encouraging and helpful to others.

Mr. Nash being an enthusiastic grower of aquatic plants, the first work done was the clearing out of the natural basins and adjusting the borders to which the waters should be confined. After clearing out the grasses and rushes it was found that the bottoms were covered with indigenous water weeds of no beauty, but of very rapid growth, which seemed an almost insuperable bar to further progress. These have been fought persistently for several years, but are still very vigorous,

and probably nothing less than a solid coating of sand as a smother will suppress them entirely. The wild growths which covered the sloping banks have been suppressed by the sand and mold which were used largely in regulating the grades. The upper reaches of the swamp have been regulated, but some of the attractive native growths of Cat-tails, bold Grasses, Arums, Azaleas, etc., have been cleared from encroaching and unattractive things, so as to leave bits of natural beauty in character with such a place. Among these, informal paths lead to quiet pools reflecting many a common and native plant which seem rare beauties in such a setting. The sloping grounds on the southern border have been somewhat cleared, and contain a multitude of Ferns, and are being gradually filled with hardy plants, placed quite informally among the sparse grasses and various creepers which now cover the ground. Some terrestrial Orchids, small Irises, etc., seemed quite in character here. But it is intended to make the water-garden the main attraction. The borders are now quite well filled with Irises (mostly *I. versicolor* and *I. Kämpferi*), *Eulalias*, Wild Rice, *Arundo Donax*, *Pontederia cordata* and *Calamus*. The main body of water is well stocked with hardy *Nymphæas*, of which there is a large variety. Some of the established plants were well in flower during my visit. The difficulty Mr. Nash experienced with his first plantings arose from the too abundant supply of cold water. This has been somewhat obviated, but the tender varieties are now grown in large basins formed by driving planks to confine the water, and in which it will become somewhat heated. The margins of these basins are masked by trailers and low-growing plants, while certain islets between them are devoted to grasses and plants with noble foliage.

Like all fanciers of aquatics, Mr. Nash has an ambition to flower *Victoria regia*, the giant of the *Nymphæaceæ*, and one of the wonders of the vegetable world. While this plant is flowered in this latitude in the open air, its growth is not entirely made there, and somewhat elaborate arrangements are necessary to bring it forward successfully. The plant, being an annual, is started from seed in strong heat, in January or early February, in the greenhouse and kept moving in warmth. As soon as the weather permits it is shifted into its permanent tank—one about thirty feet in diameter being necessary, and is covered with a tight frame with sash. It is necessary to keep the temperature of the tank at eighty degrees and upward and retain the covering until settled warm weather. The heat here was supplied by a stove, with water circulation sunk in a caisson alongside the tank. It is usual, I believe, to use the tank as the expansion tank of the stove, but here the tank was supplied with fresh water led from a greenhouse tank several hundred feet away which passed through the heater. The *Victoria* flowers in about four months from seed, the quickest-flowering being reported this season by Mr. Brydon of Yarmouthport, Mass., who had flowers in 107 days. Mr. Nash's plants will be in flower next month, and will probably be the only ones to be seen conveniently near New York City. The leaves of the *Victoria* are wonderful affairs, both in size and structurally. They are uncanny, fleshy-looking objects, but well worth a journey to see. It is a pleasure to be able to record the rapid progress of this park, which, while projected for private pleasure, is really a public improvement worth copying, especially where such waste places are prominent near traveled roads.

Elizabeth, N. J.

J. N. G.

Periodical Literature.

In *Harper's Magazine* for June there is an attractive article upon eastern Peru, written by Mr. Courtenay De Kalb, which shows how artistic, in its works of industrial art, a semi-savage race can be, and also how large a part the Palm-tree plays in these arts in the countries where it grows.

North-eastern Peru, which is called the Montaña, or "wooded country," has been brought more into contact with the outer world since the opening of the Amazon River to the traffic of all nations in 1866. But its white population, chiefly of Portuguese origin, has not yet "attempted entrance upon the domain of the arts." The landed proprietors, living in close association with troops of Indian agricultural laborers, have but sparingly introduced "the picturesque into their architecture, although the Portuguese type of structure, creeping up the river from Brazil, has feebly asserted itself as far as the materials at hand will allow," and the Spanish idea appears also in certain spots. "Here are the great porches and balconies, the open galleries letting a bit of light through the corner of the house, just under the red-tiled roof, and the pretty inner court, or patio, filled with tropical verdure." But "the pollen of Indian influence has modified exotic taste at times, where the

house resembles the Palm-thatched quincha, or native hut, and is decorated on the interior with Palm-leaf mats fastened upon the walls with the horizontally fluted Huicungo palm-posts at the doorways, and above them gratings of Palm-slats lashed together by vines, forming combinations of grace well worthy of imitation in other lands. Upon extraordinary occasions, when a dinner is to be given, they bring from the forests masses of the long green fronds of the Palm, vines all aflame with pink and scarlet blossoms, and the rich umbrella-shaped Paw-paw, and convert the banquet-room into a bower of fairy-like beauty."

As regards the minor arts, the writer says: "The common Indian is but a savage with some of the tricks of civilization, a house-builder, a planter of Maize and Yucca, a weaver of cloth and of hammocks, a fashioner of works of fictile art of surprising beauty. Without turn-table, simply by a feeling for correct form, are these jars, urns, dishes built up by hand with wooden spatulas. The decoration has become thoroughly conventionalized, crystallized, in fact, into a type of æsthetic expression which may truly be designated art. Predominant is the old classic form of fret and chevron, executed in subdued reds and deep browns upon a gray or creamy ground. Sometimes the leading design is in very heavy lines, with the ground filled in with an exquisitely delicate tracery of similar patterns. The plant-life of the forest is also reproduced—vines, not rudely delineated, but forming definite curves, springing upward at the end of the pattern and expanding into the calyx which holds the conventionalized type of a corolla, now a yellow five-rayed star, again a pink-flushed Lily's cup, or a sky-blue pendent bell. The artistic spirit displayed in these recalls the wonderful works of Inca art exhumed at the noted necropolis of Ancon. The Indian, again, manifests his appreciation of graceful form in the rounded ends of his quincha, which give an effective curve to the palm-thatched roof."

Recent Publications.

The third annual report of the Missouri Botanic Garden makes a handsome volume of one hundred and seventy pages and contains fifty-seven full-page plates. It contains the report of the President of the Board of Trustees, the director's report showing the progress of renovating the old garden and of extending and improving it, and telling of the development of the library and herbarium and of the school of botany, all of which, through the magnificent endowment of this establishment, are fast becoming of great importance and seem destined to make St. Louis the botanical headquarters of the New World.

Mr. Shaw, under his gift, has provided that a flower sermon should be preached annually in St. Louis and that the trustees of the Garden should give an annual banquet in honor of his memory, as well as a second banquet intended to bring persons interested commercially in plant-culture together. This volume contains the second of the annual flower sermons preached this last year by the Rev. Montgomery Schuyler, the proceedings at the second annual banquet which was given by the trustees on May 21st of last year at which the Secretary of the Interior was the guest of honor, and also the proceedings at the second annual banquet to gardeners, florists and nurserymen, given on the 10th of November.

Of more permanent interest to students of science are the scientific papers appended to the volume; these are Professor Trelease's *Revision of the American Species of Rumex*, occurring north of Mexico, to which mention has already been made in these columns, a paper by Professor Riley on the *Yucca Moth and Yucca Pollination*, also illustrated, and Professor Trelease's *Notes and Observations on the Genus Yucca*, which he has been engaged in studying in the field during the past winter. These notes are illustrated from sketches originally made by Dr. Engelmann, depicting the floral and capsular structure of several of the species which had never been adequately figured, which Professor Trelease had the happy idea to have redrawn in ink and then published by a process of photo-engraving. These sketches of Dr. Engelmann are supplemented by reproductions of photographs showing the habit and growth of several species which are here, in some cases, better portrayed than we have seen them elsewhere.

This volume, whose contents we have thus cursorily sketched, can be obtained at the cost of the publication (\$1.00) from A. E. Foote of Philadelphia, Wesley & Son of London, and of R. Friedländer & Sohn of Berlin; while applications for the purchase or exchange of either of the reports of the

Garden or of separate papers issued by its officers may be addressed to Professor William Trelease, the director at St. Louis.

Notes.

At a recent floral festival of the Linnæan Society of Jamaica, Long Island, one table contained seventy-five different varieties of wild plants in flower which were collected in the immediate vicinity, most of them rooted in pots. It was observed that this collection was the most attractive one in the exhibition, although the display of cultivated flowers was very showy.

A fortnight ago, New Hampshire's first state park was dedicated. This reservation consists of five acres of mountain-top on the elevation known as Pack Monadnock, in the southern part of the state. The elevation of the park is 2,385 feet, rising abruptly from the surrounding plains. The dome of the State House in Boston and the peak of Mount Washington are visible from the boulder which crowns the plateau. The land is the gift of private citizens.

No garden at this season is complete without the stately beauty of the Foxglove. Occasionally we see these plants massed together in a bed, but they lose nearly all their effectiveness in this way. They need to stand singly or in loose groups on the borders of a shrubbery or in some other place where their tall and graceful spires can be outlined against a green background. All of the colors through which they range are good, but a certain number of white ones are indispensable for the best effect.

Mr. Joseph Meehan writes us that in one of the open meadows at the National Cemetery in Arlington he recently noticed a specimen of *Quercus falcata* with a trunk measuring twelve feet in circumference. At about seven feet from the ground it branched into great limbs which reached out horizontally until they shaded a circle one hundred feet in diameter. There are many natural groves of White, Red and Black Oaks at Arlington. There are also some admirable evergreen Magnolias near the old dwelling and a good *Cryptomeria*; *Deodar Cedars* also thrive well here.

Zinc labels have been recommended for trees, and the prescribed practice has been to roll the labels simply around a branch, with the idea that as the wood grew the label would be expanded and the bark would not be cut. *Meehan's Monthly* says that this is an error, and asserts that the branch will grow over and around the label even when it simply rests on the upper part of the branch by its own weight. It is added that the only way to prevent any label or wire from growing into the bark of a tree is to attend to it every year or so and loosen it so that there is plenty of room for the wood cells to form.

In an article about Richard Jefferies, whose delightful books upon English rural scenes we have often quoted, a recent writer in *Literary Opinion* tells of a visit she had just paid to his parents who have been living for some years in Bath. She found his father, she says, "a healthy, good-looking man of seventy-five years of age, evidently the prototype of the Farmer Iden of 'Amaryllis,' and his mother a small woman of seventy-three, an invalid." They talked freely about "Dick," telling how he was always "sitting in the window, writing with a piece of pencil"; but they had read few of his books, had no conception of his fame in the world, and marveled much that for his sake they should be objects of interest to strangers.

In a late bulletin from the Agricultural Experiment Station, California, Professor Hilgard records some investigations made on prunes, apricots and peaches with a view to ascertain the proportion of pits to flesh, juice to flesh and sugar contents of the juice, and the flesh of different varieties. In regard to the nutritive value of certain fruits it has been stated in former bulletins that the orange in California rated the highest, but these researches give the apricot an equal rank, while the prune follows next, with grapes, bananas, apples and pears succeeding each other probably in the order named. Grapes stand first among the fruits in the quantity of mineral matter they take from the soil. The apricot, taken according to weight, holds the second place in this respect, while the prune and the orange come third.

In his recently published book, called, "With Poets and Players," in a chapter devoted to "Botany on the Boards," Mr. W. D. Adams says: "Great progress has been achieved of late years in the art of making stage trees and shrubs and flowers seem natural and convincing. In theatrical arboriculture in particular great strides have been taken. It is nothing

new to find the centre of the scene occupied by what, to all appearance, is a genuine tree, with real trunk, arms, leaves and blossoms. In these respects the stage mechanists of today can almost, if not quite, deceive the eye. . . . But such triumphs of the imitator's skill do but serve too often to show up in brilliant relief the unreality of the mock stone and wood surroundings in the way of house or fence. And too often, indeed usually, the stage-tree is only too obviously of the stage, stagey."

There are so many beautiful kinds of Lilies, each with a charm of its own, that it would be hardly just to single out one and pronounce it more beautiful than all the rest. But certainly it would be hard to name one that excels in good qualities the old-fashioned Ascension Lily (*Lilium candidum*), which has been cultivated probably as long as any other flower known in gardens. The disease which has injured it for some years past seems to have run its course; at least, these Lilies were never more luxuriant or the flowers more perfect than they have been this year. A mass of these flowers in full bloom, with some dark green foliage behind them, is a beautiful spectacle, and so is a group of them mixed with the tall blue spikes of the perennial *Delphiniums*. Hardy Lily-bulbs are usually planted in the autumn, but the bulbs of this one should be lifted in late July or early August and planted at once. At that time the stalks have died down, and soon after new roots begin to put out, and some glossy radical leaves spread over the ground and remain green all the winter. The bulbs should be planted before this new growth starts, or there will be a great loss in the vigor of the plant's growth.

The last number of *Forest Leaves* contains an interesting illustration, entitled, "A Historic Tree in Transit," and it represents a tree, seventy feet long and thirty-six inches in diameter, placed on a platform and moved along on rollers by block and tackle. The tree itself has a historic value, as it is an offshoot of the great Penn Treaty Elm which stood in Philadelphia. This tree measured twenty-four feet around the base, and one branch of it was one hundred and fifty feet long. It blew down in 1810, and a shoot which came up from the roots of the old tree was carried to the Oliver estate at Bay Ridge, New York, where it has stood for more than fifty years. This is the tree which was removed from there to the grounds of General Paul A. Oliver of Forest Roads, Oliver's Mills, Pa., whose ancestors owned the ground on the Delaware where the Treaty Elm stood. It was a bold undertaking to move so large a tree for 175 miles, especially since it had to be moved by horse and hand-power at the beginning and end of the route. General Oliver wrote on the 20th of June that the tree seems to be growing well and promises to thrive in its new home on the mountain-side as well as it did by New York Bay.

That portion of France which is called the Midi (the South), says Monsieur de Vilmoren, in his recently published book on *The Flowers of Paris*, includes all the territory lying south of Orange, and, consequently, the lower valley of the Rhone and the borders of the Mediterranean; but the term is more specially applied to the French portion of the Genoese coast between Hyères and Vintimille. This region is the great winter flower-garden of Paris, and, indeed, of a very large part of Europe. And its special adaptation to the winter cultivation of flowers is thus explained: "The peculiar climate depends upon several causes. In the first place, heat is persistent, as solar action is interfered with by clouds only one day in four. Then mildness is preserved in the valleys by the fact that they do not open directly upon the sea, but approach it obliquely; and thus, of course, the hills which lie between them and the sea are well exposed to the south and offer very favorable locations for plants which require a great deal of heat. This disposition of valleys and hills protects them almost completely against the cold winds of the north, and especially against the mistral, which, a little farther northward, destroys all delicate plants. On the other hand, the wind which blows from the sea, bringing with it the warmth of the African shore, finds no obstacle, and the immediate vicinity of the sea always equalizes the temperature of a country. . . . A particular characteristic of cultivation in the Midi," adds the author, "is the great use made of protective coverings; for the same reasons which cause the great heat of the day also produce great chilliness at night. The sky always being very pure, nothing opposes the radiation of the soil and its plants, and, therefore, these last have always been covered by coarse mats of reeds, which may also serve to protect delicate flowers from the burning rays of the sun. Recently, however, glazed sashes have come into use, and are now almost universally employed instead of the mats, being heated, except in rare instances, by nothing save the rays of the sun itself."

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLE:—Simplicity in Landscape-art.....	313
A Bit of Wild Nature in Pennsylvania. (With illustration.)	
<i>Professor W. A. Buckhout.</i>	314
A Manufactory of Roses.....	<i>Henry de Vilmorin.</i> 314
Late June in the Garden.....	<i>Mrs. Danske Dandridge.</i> 315
The Mutual Influence of the Stock and the Graft.....	<i>A. A. Crozier.</i> 315
Fruit Trees in Flower.....	<i>E. P. Powell.</i> 316
NEW OR LITTLE-KNOWN PLANTS:— <i>Jacobinia magnifica.</i> (With figure.).....	<i>W. W.</i> 317
<i>Gladiolus Armeniacus.</i>	<i>J. N. Gerard.</i> 318
CULTURAL DEPARTMENT:—Notes on Shrubs.....	<i>J. G. Jack.</i> 318
Indoor Work in July.....	<i>W. H. Taplin.</i> 319
<i>Actinidia polygama.</i>	<i>E. O. Orpet.</i> 320
The Garden in June.....	<i>J. N. Gerard.</i> 320
The Importance of Microbes in the Cultivation of Plants.....	<i>E. C. Lodeman.</i> 321
CORRESPONDENCE:—New England Country Houses.....	<i>Mrs. J. H. Robbins.</i> 321
A Foreigner's Impressions of America.—III.....	<i>Cealia Waern.</i> 321
PERIODICAL LITERATURE:—The Forms of Trees.—I.....	<i>Gustav Eisen.</i> 322
NOTES.....	323
ILLUSTRATIONS:— <i>Jacobinia magnifica</i> , Fig. 56.....	317
Lumbering in Bear Meadows, Centre County, Pennsylvania, Fig. 57.....	319

Simplicity in Landscape-art.

ONE thing that used to strike the traveler in Europe with a sense of novelty was the look of cultivation about the railway-stations, and few things in this country bear greater evidence of the advance in civilization among us than the improved aspect of these public thoroughfares. In fact, everywhere in the east we are conscious that the air of raw newness, of uncombed carelessness, is beginning to yield to the demand for order and comeliness of arrangements. The idea that system may be applied to even very limited portions of ground is gradually making way, and people are beginning to consider not so much what they shall plant as how they shall plant it so as to produce the best effect.

There is a taste for beauty latent among our people which thirsts for guidance, and only needs good examples to develop it properly. They eagerly seize upon such advantages of instruction as are afforded, and show their desire for new light in various ways. The village improvement societies are a step in the right direction, and the well-kept door-yards in small New England towns, the trig and thrifty air that pervades even the humblest homes, show that there, at least, the new ideas have taken root, and are ready for evolution. What is most needed now is to train and educate this love of the beautiful and befitting, by setting authoritatively before the public evidences of the right way to produce good effects in the management of trees and shrubbery, and to make public resorts serve to emphasize the important truths of simplicity and unity in design.

We do not have the advantage here of free access to the gardens and parks of royalty and nobility, as European peoples do, to educate our understanding. Such examples as the public has had in old times to copy have not always been of the best. There have been no great gardens like those of Versailles and of Luxembourg thrown open to

everybody on festival days; it is only within the last twenty-five years that carefully planned parks have been accessible to the million, and that cities have decorated their pleasure-grounds with shrubs and flowers. How eagerly the people seize upon these advantages, how jealously they guard their rights to them we all know; but not every one recognizes the educational value of these well-kept open spaces, nor do we perhaps grasp the full force of the refining effect that the contemplation of good landscape-gardening has upon the minds of the masses, who are imperceptibly led by it to understand the value of composition in the arrangement of growing things, and thus are taught a lesson in beauty.

To love beauty is far easier than to know what beauty is. The most beautiful things are not, as many people think, within easy grasp of the understanding. Beauty of an unfamiliar kind does not always seem beauty at the first glance. It has to educate us to understand it, open our minds to its preciousness, and lift us to the higher level of its charm before we begin to recognize it. The Hermes and Aphrodite of the Greek mean nothing to the Australian black fellow, nor do they appeal profoundly to any untrained intelligence, for perfection in the human form is unfamiliar to the average eye, accustomed to look alone upon the face for beauty, with its ideas of figure outline warped by the conventionalities of fashion.

The greatest objects in nature—even Niagara itself—is disappointing to the visitor until he has dwelt for a space upon its borders, and has learned the full terror of its majesty. Day by day the torrent grows more imposing, its ceaseless roar more impressive, the sweep of foaming water more turbulent, the crisis of the great fall more tremendous. It is so with the glories of a mountain-region. One's first glimpse of the Alps may be awe-inspiring or commonplace, according to the atmosphere, but it is only a long sojourn among mighty hills that fully reveals the power they possess over the soul of man. No superficial view can reveal their secret. Alone with the humming of bees amid the Alpine roses, with snowy peaks upon peaks rising needle-like against the blue, and lonely eagles soaring slowly into the upper ether, one feels a stirring within him as of wings, and becomes conscious of that inward bursting of bonds which denotes mental growth. Then the mountain speaks to man, and the favored mortal learns a new lesson of beauty.

The truth, well established in literature, art and music, that any new departure has to create a taste for itself before it can be accepted, is equally recognizable in landscape-gardening, which may justly be ranked among the higher arts, since he who takes nature for his theme uses trees and flowers for his pigments, and is the greatest of all painters. What seems the easiest, and yet is perhaps the hardest to learn of all, is the lesson of simplicity. To accumulate is the natural instinct of man; to overcrowd both house and land; and yet neither within nor without does quantity produce quality, and the higher one's artistic sense develops, the more does he value space as an element of dignity and loveliness. The true value of a picture is best obtained when it hangs alone upon a wall. The beauty of a precious vase is lost in the confusion of a cabinet. The Venus of Milo, standing solitary in her curtained alcove in the Louvre, is more impressive than the gallery of other Venuses which leads up to her shrine. So may one obtain the strongest effect for a group of trees, or for one giant specimen considered by itself, if they are left to stand alone, in one great sweep of lawn, which shall emphasize by contrast every noble curve, every up-lifted bough, and produce one salient point in a lovely picture.

A mass of foliage in a shrubbery, forming one continuous and graceful line of varied shades of green, interspersed with sprays of blossom, is finer than a spotted effect of numerous isolated bushes, however beautiful in themselves. A group of plants in a garden all of one kind is usually better than a mixture of different plants. A

pleasance should ever be a picture, and be treated with the same artistic care, not to spoil its unity or to muddle its lights and shadows, that the painter should show when dealing with his canvas. Tone, gradation, emphasis are as important in the garden as in the drawing. There should be a high light, a depth of darkness—a middle distance, a foreground and a perspective. This, as the Japanese show us, can be managed even in a tiny enclosure; but what the average gardener lacks is courage to destroy. It is only a master in landscape-construction who dares to cut a swathe through a forest, or fell a giant to improve a vista. Such a destroyer, as we have shown before, is looked upon with terror by the uninstructed, when he demands the sacrifice of some long-cherished Oak or Pine which has been an object of family pride for years. The flower-beds have always been in one spot, why should they be disturbed? A grandfather planted that Chestnut; there is a sentiment against cutting it down. It is obstructions of this kind that are encountered by him whose far-seeing eye looks into the future, sees the perfected picture with all its detail subordinate to one leading thought, and grows impatient at what seems to him irrelevant obstruction.

The first lesson of beauty, then, to be learned by the student is the lesson of simplicity and breadth. To this he must come by the hard road of sacrifice, giving up many a cherished prejudice, many an object long unwisely valued. When he has grasped this idea as of preëminent value, he will have made the first step in a true knowledge of the requirements of landscape-gardening as an art, and will have permanently mastered an elemental truth with regard to all artistic beauty.

A Bit of Wild Nature in Pennsylvania.

THE "Bear Meadows," in Centre County, Pennsylvania, have long enjoyed a local reputation among lovers of nature as one of those odd places so different from its surroundings as to excite great curiosity. It is simply a peat-bog, occupying, perhaps, a mile square of what, if the drainage and water-flow were better, would be a "kettle," in the hunters' vernacular. The surrounding ridges, though low, are ample enough to give a small, but very constant, stream, the outlet of which being impeded holds back the water, once, perhaps, as a small lake, but now silted and choked with peat, through which the sluggish dark-colored water slowly forces its way.

Such a bog, in a region where bogs and lakes are uncommon, almost unknown, has naturally been a marked spot in the topography of the neighborhood and a favorite and attractive place for hunting and fishing. To a naturalist the chief attraction is in the curious commingling of the flora. The centre is covered almost exclusively with the commoner and coarser Sedges, with here and there clumps of Alders and occasionally Cranberries. The peat is here over ten feet deep, and shakes perceptibly under the tread. The larger area, however, is the border of the marsh, over which is a vigorous growth of a great variety of trees, in marked contrast to the meagre selection afforded by the surrounding higher lands. Many species, too, have acquired unusual size, and though culled out more or less, the general effect is of the "forest primeval." Huge White Pines, Tulip Poplars and Red Maples are frequent. Black Spruces abound in certain places, and reach large dimensions, their dark spiry tops making a skyline in sharp contrast with the other trees. In much smaller numbers, and seldom more than a foot in diameter, are the Balsam Firs. Locally, both species are called Tamarack, a curious misnomer, the occasion for which I have not been able to discover. Their small slender trunks have always been in great demand for flag-poles, hay-ladders, etc., and but few would have been left had the meadows been more accessible.

Of minor plants there are many to attract the visitor. Probably to most persons the Pitcher-plants are the most curious, since they grow nowhere else in the neighborhood. Bedded in the Sphagnum-moss they are perfectly at home, and grow vigorously. Gold-thread, the Painted Trillium and the Buckbean (*Menyanthes*) are other characteristic marsh-plants of the north that are here. The latter seems quite out of its latitude. It is not abundant, and does not seem to be holding its own. In places the round-leaved Sundew is abundant, and so are the delicate little Star-flower (*Trientalis*) and the dwarf

Cornel. The smaller *Smilacinas* and *Clintonia borealis* are frequent and very vigorous, and their symmetrical polished green leaves at once attract attention. Orchids are naturally sought for in such a place. Some are quite common, such as *Cypripedium acaule* and *Habenaria ciliaris*, both running up and into the drier ground, and often quite striking because of their abundance. Less commonly met with are *H. tridentata*, *Listera cordata*, *Pogonia verticillata* and *Calopogon pulchellus*. Still others would doubtless reward a careful search were one to take time at the proper season for them. It is slow and tiresome work to explore the tangled parts of the border and the drier hummocks. The thickets of *Rhododendron* are exceedingly dense, and when mixed with the common Green-brier (*Smilax*) are scarcely penetrable.

In these thickets were made the bear traps or pens, from which the name Bear Meadows is derived. In days gone by this was the great fascination the meadows had for the hunting fraternity. At some one of the numerous springs about the border was the favorite place to camp. Cooler, more soft and delicious water than came from these sand-stone springs nowhere existed, while the charm of a summer-night here under the stars was indescribable. Nowhere else did the air seem so balmy and invigorating, and that exquisite music, the sighing of the Pines, was seldom wanting.

About three years ago, in writing to *Forest Leaves*, I said that a lumber company had recently begun work hereabout, were building a tramway with which to reach the meadows, and were preparing to cut, as they expressed it, "everything down to the size of a stove-pipe." Thus far they have been cutting chiefly the Pitch Pine, which goes to the anthracite region for mine-supports or "prop," as it is called. They have now begun to penetrate the meadows, have put up a mill, and are sawing the larger timber. The best of the White Pine is cut up into bridge material, the poorer and refuse parts into shingles, pickets, etc., while the Spruce and Fir, so far, all goes to the pulp-mills. The illustration (page 319) shows one of the White Pines which have been felled, and gives the imagination an opportunity to picture the changes which a band of energetic choppers are likely to bring about after they have worked their will in a forest. The ground is more marshy here than the picture indicates. The tramway rests on slabs to keep it from settling, and horses are preferred to mules, because the smaller hoofs of the mules sink more easily in the soft footing.

The fear that fire would follow in their wake has in part been realized. Last year was the worst for many years, while this season there have been no fires at all.

Considering the marshy nature of the meadows themselves, it may be that even after being thoroughly worked over and littered with tops and rubbish, the swamp may escape a general conflagration. This would be fortunate, for, left again to Nature's tender care, it would in time be re clothed and renewed, and be, perhaps, to another generation what it has been to this—a place of unspeakable restfulness. Nature has here been left alone to do her perfect work, and the Bear Meadows are so closely walled in by mountain-ridges that the busy work-day world seems hundreds of miles away.

State College, Pa.

W. A. Buckhout.

A Manufactory of Roses.

THE following translation of an article by M. Henry de Vilmorin, in *La Revue Horticole*, appeared in a recent number of the *Literary Digest*:

I have several times had occasion to visit the famous Park of Roses, at Nice. The flowers produced there are the most beautiful in the world.

Both banks of the Var are bordered by a line of hills of some height, which are prolonged as far as the sea. The hills on the left bank aid in protecting the whole plain of Nice from the north-west wind. Toward the southern extremity of these hills, on very rich, alluvial soil, is the Carras quarter, in which are the principal market gardens of Nice. In that quarter, also, a little higher up on the slope of the hill, is the Josephine Villa, or Park of Roses.

Here roses are cultivated exclusively for sale in winter as cut flowers. Out of the twenty-eight or thirty acres which the property comprises, about ten acres are devoted to the purpose of forcing the Rose-trees, and are covered with very numerous small greenhouses or extensive hot-bed frames, one or the other of these being always in use for furthering the production of the flowers. The total surface covered with glass exceeds 6,000 square metres, or an acre and a half.

Naturally, it is during the months of active sale, from

November to April, that the principal harvest occurs; but even in the spring and summer the very beautiful roses grown under shelter are in demand by the dealers. These roses are the only ones, or nearly the only ones, which show a purity of perfect tint, exempt on the outside petals from the discoloration, the veining and folds, which are caused by the bite of cold, too warm sun-strokes, or the prolonged action of humidity.

During the summer the movable sides of the greenhouses are taken away, and there remains only the glass roof which protects the flowers from the rain-storms.

The proprietor and founder of the establishment is Mr. Antoine Mari. It may be said that the most striking feature of his mode of cultivation is the simplicity of the means employed and their perfect adaptation to the end to be attained, which is to obtain an abundant and continued production of flowers without great expense and without exhausting the plants.

A Rose-bush, as is known, does not require a high temperature. Certain varieties, like the Saffron Rose, continue to put forth buds and flowers all winter long in Provence, and well-developed roses of that variety can be picked at the end of November even in the climate of Paris. At Mr. Mari's place the Rose-trees are planted either in three lines, parallel to each other, for the bushy variety, or, in the case of those with flexible stalks, each by itself, something like Grape-vines, as, for instance, the Marshal Niel. They are sheltered by frames just high enough above the ground to allow of man walking about inside. At the height of the season, from December 15th to April 15th, the Park of Roses sends away an average of five hundred dozen roses a day.

At the last Floral Exposition at Nice I had an opportunity to admire the choicest products of Mr. Mari's establishment. There were Paul Neyron Roses more than twelve centimetres (four and three-fourths inches) in diameter; Marshal Niels so enlarged that a dozen buds half-opened weighed together more than eight hundred grammes (1.76 pounds avoirdupois), some La France Roses of a marvelous size and symmetry, and some Paul Nabonnands, nearly as large as the Paul Neyrons, and of a deliciously fresh color. All the roses, without exception, had a perfection of form and a brightness of tint which left nothing to be desired. It is no secret that a large proportion of the most beautiful roses in the most elegant flower-shops in Paris come in a direct line from those cultivated by Mr. Mari.

The Park of Roses brings to its proprietor a net annual revenue of 10,000 or 12,000 francs for every two and one-half acres of land.

Late June in the Garden.

I HAVE been wishing for an artist's skill to portray the pretty picture that greeted my eyes the other day when I peeped into a Yucca bell. They were not fairies, the dainty occupants, but they were as pretty as fairies, although they took the shape of pure white moths less than an inch long, who had fancied the Yucca's spotless cool interior for a noon-day nap. There were at least a dozen of them. I looked into other bells on other Yuccas and found them occupied by the same airy visitants. Are these the Yucca moths whose mission is to fertilize these beautiful blossoms, and thus to pay for bed and board? A heavy thunder-shower came up; the Yuccas swayed in the wind, bent over until they swept the ground, and the blossom seemed too frail a tenement to sustain its occupants. I felt sure that they would be dislodged and blown about at the mercy of the elements. The rain fell in sheets, and when the storm was over I peeped again into the dripping bells. Not a moth guest was discomposed; all seemed to sleep serenely, waiting for the fire-fly signals that should herald the summer-night and awaken them to elf-like revels under the mighty Oaks.

Nothing can be more beautiful than the night aspect of the immense clusters of Yuccas, some of them planted forty years ago, which are now blooming in many places in the old garden, holding up tall candelabra to be filled with moonlight, which they catch in every chalice of pearl. Some of the flower-stalks are seven and eight feet in height. The first to bloom was *Y. filamentosa*, variety *flaccida*. Several varieties planted last year, such as *Y. superba*, *Y. angustifolia* and *Y. recurva*, have not yet bloomed, but are making satisfactory growth. These crown a little hillock north of the house, in company with some *Rhododendrons*, *Aucubas*, *Laurels* and *Arundo donax*. With all of these they combine effectively. They seem to rather enjoy drought and neglect, and thrive well when left to themselves, but are very easy to transplant and hard to kill. I have seen them rooted and blooming happily on top of an old rubbish-heap where they had been thrown to die.

The common name for this plant hereabout is Cliff-lily. I do not know why it is so called, unless it be that it prefers hilly ground in its wild state. Several years ago, when I knew the botanical names of very few plants, I was led by the enticing descriptions and beautiful illustrations—which I did not recognize—in the catalogues to send for a few roots of *Yucca filamentosa*, and was as much chagrined as surprised to find when they came that they were the familiar Cliff-lilies with which the garden was already overstocked.

Trumpet Creeper (*Tecoma radicans*) is flaunting its orange-scarlet blossoms everywhere. It has subjugated the old paling-fence and converted it into a most luxuriant hedge, and it scoffs at all control and riots over the beds and up the shrubs and trees, peeps out in most unexpected places and keeps one busy all summer long in the vain effort to reduce it to submission. Now it is detected in the act of strangling a promising young fruit-tree, again it is quarreling with the Clematises for the possession of a trellis; it has taken all the best places in the Honeysuckle-arbor, and conquered a rock-brake under the Cherry-trees north-east of the house, which it beautifies in its own wild fashion, and where it is quite welcome to twist and twine and luxuriate at will.

Very large clumps of Hollyhocks of white, yellow, rose, red and wine-colored shades are still blooming. One of these clumps in front of the carriage-house seems most appropriately placed. There is a suggestion of homeliness about this flower, in spite of its stately beauty, which makes it fit such a situation best. Farther down the grove, in too close proximity to the Oaks and other forest-trees, it would seem misplaced, but in the neighborhood of buildings and in fence-corners and garden-borders it is perfectly at home.

Many *Spiræas* are now blooming. Among the prettiest of these is *S. Bumalda*, which is a *Spiræa* of small size, growing rapidly to maturity in good soil, and producing its pretty clusters of pink blossoms all summer long. It is grouped with the white variety, *S. callosa*, and the pink and white flowers of these two *Spiræas* mingle very pleasingly.

S. sorbifolia is just coming into flower, and is a large bush of rapid growth, handsome white flowers and beautiful Mountain Ash-like foliage. It is planted in company with *S. Lindleyana*, which has not yet blossomed at Rose Brake. This latter has somewhat similar foliage, seems quite hardy here, but does not grow very fast.

S. callosa is now very pretty, with large clusters of bright pink showy flowers, and *S. Billardii* is a great bush, covered with spikes of rosy bloom, very ugly when they fade, and requiring much attention from the garden-scissors to keep it presentable.

Privets are flowering, and a pretty little *Cytisus*, labeled *C. capitatus*, is giving a few heads of bright yellow blossoms, which are slightly fragrant. *Ceanothus Americanus*, or New Jersey Tea, is a neat little shrub with numerous clusters of tiny white flowers, very much resorted to by little, round, shiny black rose-bugs, dainty little epicures, which seem to prefer all our prettiest flowers. They are very troublesome to the Ramanas Roses, which are still in bloom, and they eat the blossoms of the pink-flowering Raspberry (*Rubus odoratus*), whose boasted fragrance I am unable to detect, although I am, perhaps, unusually sensitive to the perfume of flowers.

At this season the *Polyantha*, or Fairy Roses, flower very profusely. Indeed, they never stop blooming until checked by hard frosts. The hybrid Clematises, though some of them are less interesting than the species, are giving abundant flowers of various colors, and the pure Madonna Lilies, which are very beautiful in a large cluster on the lawn.

The meadows are gay with white, purple and pink Larkspurs, with Milkweed, white and yellow Daisies, the blue flowers of the Viper's Bugloss, and many other sturdy plants. Here and there an orange-colored patch of *Asclepias tuberosa* delights the eye; neglected orchards are overrun with Wild Mustard, and Elder-blossoms are still whitening the hedge-rows and corners of the pasture-fields with late wild Roses in loving companionship.

Rose Brake, W. Va.

Danske Dandridge.

The Mutual Influence of the Stock and the Graft.

IN the report of the Michigan Horticultural Society for 1891 Mr. A. A. Crozier has a most instructive paper on this subject. He collects together most of the opinions which have been published, together with the evidence upon which these opinions are based. As a rule, the observations here put on record have not been based on direct experiment undertaken for the particular purpose of determining the modifying influence of either the stock or

the graft. Many of the statements are contradictory, and much of the testimony has to be rejected. Some of the changes said to have been observed are plainly imaginary, and Mr. Crozier has allowed them to appear simply to show what beliefs have been held. Careful and well-directed experiment will, of course, be necessary before the points involved are settled, and we are pleased to observe that Mr. Crozier himself promises to conduct some of these trials. But, although this evidence reported is not all of very serious value, there are altogether forty pages of quotations published, and a careful examination of them gives abundant proof that both stock and graft do influence each other's growth in very many ways, and Mr. Crozier gives the following conclusions which he has deduced from a careful study of the existing evidence :

SIZE AND VIGOR.—The stock and graft each imparts to the other something of its own degree of vigor or lack of vigor. This influence is greater the first year or two than afterward. If the difference in vigor is great, both stock and graft may ultimately perish. The dwarfing which in certain cases results from grafting does not always arise from a diminished supply of food, but often indirectly from earlier and more abundant fruitfulness.

FORM.—The alterations in the forms of trees, as the result of grafting, arise mainly from increased or diminished vigor. This probably applies also to alterations in the form of the roots, vigorous roots having larger, longer and fewer branches than feeble ones. Many of the observed changes, however, in the form of the roots of grafted trees, are probably due to the trees having rooted from the graft. The observed changes in the form of the fruit of the graft, causing it to resemble that of the stock, are as yet too few to be considered other than accidental.

FRUITFULNESS.—The most important of all the results of grafting is increased fruitfulness. This is brought about (1) by the mere process of grafting, which operates in the same manner as a ligature; or the removal of a ring of bark; (2) by diminished vigor through defective nourishment from a feeble stock; (3) by increased vigor imparted by vigorous stocks to varieties which are naturally too feeble to bear heavily.

PRECOCITY.—Earlier, as well as more abundant, fruiting is induced by the act of grafting; also by diminished vigor due to dwarf or feeble stocks. The precocity of trees on dwarf stocks is not, however, always directly due to diminished vigor, but largely to the habit of early bearing imparted to the graft by the stock in a manner not fully understood. Probably the diminished supply of sap derived from dwarf or feeble stocks, and its consequent richer character, is an important factor in inducing the earlier and more abundant fruitfulness.

SEASON OF GROWTH AND MATURITY.—The stock and the graft each modifies the period of vegetation of the other when their normal times of beginning or closing their season's growth are different. Thus, a late variety grafted upon an early stock begins and ends its season's growth earlier than it otherwise would. This alteration in habit appears in some cases to affect the time of ripening of the fruit.

HARDINESS.—There is some evidence that hardy stocks increase the hardiness of the grafts. This, however, does not appear to be by the transfer of any inherent hardiness peculiar to the variety, but to result from the increased or diminished vigor in certain cases or an earlier maturity in varieties which, upon their own roots, are inclined to grow too late in the season. The advantage usually sought in hardy stocks is to furnish hardy stems able to resist injury to the bark by sun-scald, etc., and to supply roots of uniform hardiness in place of those of ordinary seedlings which are frequently less hardy than those of most cultivated varieties. Conversely, a hardy graft has been known to increase the hardiness of the stock, but known examples of this are rare, and usually no such influence can be observed.

ADAPTATION TO SOIL.—“Favored by the influence of the stock, many species are able to thrive in unfavorable soils, and often in those in which they could not live if upon their own roots.” There is in this fact no evidence that the character of either stock or graft is modified. In some cases, however, the demands of a vigorous or fruitful graft may render the roots of the stock more exacting as to soil, so that they require one which is more fertile or of more definite character in which to maintain in health the grafted tree than would be required for a tree of the same kind as the stock growing in its natural state.

COLOR.—An alteration in color, as the result of grafting, may occur (1) by the direct transfer of coloring matter, as in the ex-

ample of the white and yellow carrots; (2) by earlier or later maturity; earlier maturity inducing more heightened color; (3) by the restoration of normal nutrition to a “variegated” stock or cion; (4) by the transfer to a healthy stock of the disease known as variegation. There is little evidence that the characteristic color of fruits is modified by grafting.

FLAVOR.—The testimony is abundant that fruits may acquire the flavor of the fruit of the stocks on which they are grafted; this has been especially noticed in the case of sour Apples grafted upon sweet varieties. Other modifications in the flavor and texture of the fruit have been noticed which do not cause them to resemble the fruits of the stock. The operation of grafting itself often causes the fruit to be larger and more succulent, and to ripen earlier; this latter change, when it causes more perfect ripening, improves the flavor. We can say that certain stocks improve the flavor of fruit borne by the graft, while others deteriorate it, and that it is probable that stocks bearing highly flavored fruits intensify the flavor of the fruit borne by the graft, while stocks bearing fruits which are sweet or mild in quality diminish it; but, notwithstanding the abundant testimony to this end, direct and careful experiments are needed.

DISEASE.—The evidence is conclusive that certain diseases may be conveyed from stock to graft, and vice versa. This applies not only to diseases caused by parasitic fungi, but also to the peculiar form of malnutrition known as variegation. It will be observed that nearly all the best-established changes which are noted are due to altered nutrition, and though they sometimes cause the stock and graft each to acquire some of the features of the other, these alterations extend mainly to such points as vigor, color and period of vegetation, and in no case can they be considered to be of the nature of hybridism.

Fruit Trees in Flower.

I AM advised by friends to cut down a huge Pound Sweet Apple-tree which stands among the shade-trees on my lawn, but in my judgment none of the rare and beautiful trees which are called ornamentals surpass this one when in flower with its exquisite shades of white and red. The love of the Japanese for Plum and Cherry-trees amounts to a passion and almost a worship, and this, not because of their fruit, but of their flowers. During the season of apple-blossoms I have driven about the country a great deal and made notes of some remarkable developments of high-colored flowers in certain individual trees. I found one growing near the roadside with flowers of a fairly dark purplish red, a tint I have never seen before. Another tree I have found which bears blossoms closely approaching scarlet in color. My purpose is to secure cions of these trees and have them grafted next spring, for as flowers they deserve to rank among our richest. Certainly it is worth while to collect examples of such variations so that we can see apple-blossoms carried through their widest range of color.

The Peach is always beautiful in flower, but occasionally some individual tree is almost startling in its attractiveness. The rule seems to be that the finer sorts of Peaches have less conspicuous bloom. The very handsomest trees in flower are the wild ones along the wayside in Kentucky, Missouri and Arkansas. Some of these ought to be selected and treated purely as flowering trees. Cherries, so far as I know, do not have blossoms which sport into colors, but a Morello is sufficiently attractive in white. It is a complete globe of flowers and small enough to occupy a place in an ordinary shrubbery. Then, too, it has a capacity for blooming when very young, and a tree three years old will burst into a miniature flower-garden three or four feet in diameter.

Pear-trees appeal to us for the beauty of their foliage as well as their flowers. This is the one fruit tree with rich glossy leaves, and sometimes it has a noble and unique habit, while in the autumn it gives us unsurpassed colors of foliage. The Buffam is one of the best trees to plant where a fastigate form is needed, and it is unrivaled for the crimson and purple of its October foliage, besides which it is a delightful tree in bloom. Some of my own trees, twenty feet high and no more than six or seven feet in diameter, form a pyramid or sugar-loaf of perfect white in flower. Of course the flowers of all these trees are evanescent, but so are those of most other flowering trees and shrubs, and certainly in planting trees for the beauty of their flowers these fruit trees should not be entirely neglected.

Indeed, the whole family of Rosaceæ is eminent for the freedom with which they yield delicate flowers. Some sorts of Strawberries can be used very effectively as edgings, and after the bloom is over the show of fruit is very pleasant to

the eye, especially on such plants as carry it well up out of the dirt but on stalks not too long. Such varieties as Haverland, for example, are not useful for this purpose, but Cumberland is excellent, and among some cross-bred varieties I have one with semi-double flowers which is most interesting to look at. Dewberries are admirable screens, and so are the so-called Wine Berry and our native Thimble Berry.

There are few shrubs which can rival the beauty of a Quince-tree in full bloom. On the first of June I had a small orchard of forty of these trees covered with flowers, and it was a superb spectacle. I grew a few of them in my shrubbery for the sake of the flowers alone, although the pale

flower, is always a delight to the eye. There are few finer shrubs than the dwarf Apples, and both the Apples and Cherries can be managed very readily in this way.

Clinton, N. Y.

E. P. Powell.

New or Little-known Plants.

Jacobinia magnifica.

THIS is a useful greenhouse-plant which formerly was commonly grown in English gardens, but is comparatively rare here now. Like most of the *Acanthaceæ*,



Fig. 56.—*Jacobinia magnifica*.

downy leaves have a value in a landscape. The flowers are equal in beauty to those of the *Stuartia* or an *Exochorda*.

Again, most of our fruit trees are as beautiful in fruit as they are in flower. To my imagination there is not a more beautiful object than a large Snow Apple-tree in October. I always dislike to pick off Jonathan apples from the tree, they are so beautiful as they hang upon the branches. What more beautiful picture can be seen than a Morello or Richmond Cherry-tree just as the fruit is turning crimson. I have said nothing of the value of dwarf trees for lawn-planting because many persons make a failure when they attempt to grow handsome trees in this way. Such failure is not necessary, however, and a dwarf Richmond Cherry, either in fruit or

it is either a scraggy weed or a handsome little shrub, according as it gets bad or good treatment. At Kew it is grown in quantity for the conservatory, flowering with a rush in November or December. It is raised every year from cuttings struck in heat in March and grown on in a warm moist house until July. The plants are by this time in six-inch pots, in which they remain until they have flowered. They like a rich open soil, such as suits *Begonias*, and plenty of water. From July onward the plants are placed in a frame where they get plenty of sunlight and air, the lights being removed on all favorable occasions.

By November they have formed compact little shrubs (they are stopped twice), leafy to the top, and from a foot to one and a half feet high.

The stems are quadrangular, the leaves opposite, lanceolate, wavy, with prominent veins and covered with a soft down-like tomentum. The largest leaves are nearly a foot long by three inches in width, but the bulk of the leaves are only about half that size.

The flowers, which are a rich rose-purple color, are arranged in dense terminal heads, as shown in the picture, which has been prepared from a Kew plant. The old plants—that is, those that flowered last December, and a few which were preserved for the supply of cuttings—are now flowering again. There are several varieties of this *Jacobinia* in cultivation, namely, *J. magnifica*, var. *carnea*, figured in the *Botanical Magazine*, t. 3382, as *Justicia carnea*, and which, according to Lindley, was sent from Rio to the Royal Horticultural Society in 1827. This has glabrous leaves and flesh-colored flowers. The variety called *Pohlina* is, I think, so widely distinct from what is here figured as to deserve specific rank. It has ovate-acuminate leaves, almost cordate at the base, thin in texture, quite glabrous and tinged with purple beneath.

The flowers are bright crimson in color, and they differ in other particulars from those of *J. magnifica*. It was formerly called *Cyrtanthera Pohlina*, under which name it is still known here and there.

Other species of *Jacobinia* similar in habit to that here figured, and well worth growing for their handsome flowers, are *J. aurantiaca*, introduced by Makoy & Co., of Liege, Belgium, in 1849, who distributed it as *Calcostylis aurantiaca*. It has four-angled stems, lanceolate smooth leaves and large terminal heads of yellow and orange flowers. Another handsome yellow-flowered species is *J. catalpæfolia*, which has large cordate leaves and flowers arranged in terminal heads six inches long and four inches through.

J. coccinea flowers in summer. It has rather rigid cylindrical branches and lanceolate leaves, with heads of crimson flowers. It is sometimes met with under the name of *Aphelandra cristata*.

According to the *Genera Plantarum*, there are about thirty species of *Jacobinia*, all natives of tropical America. The genus now includes *Cyrtanthera*, *Libonia* and *Sericographis*.

London.

W. W.

Gladiolus Armeniacus.

THE numerous showy hybrid Gladioli have so far superseded the species in cultivation that, with few exceptions, one seldom sees any of the Cape or Asiatic species. There are very many of these, and among them a number of interesting things, but practically of little garden value in comparison with the hybrids of the florists. One of the newer species from Herr Max Leichtlin is *Gladiolus Armeniacus*. This has proved with me entirely hardy under cultivation. The leaves are narrow and grass-like, and the flowers, opening in May, are borne on slender wiry stems, say, one foot high. In color they are a violet-purple, self-colored, except that the lip has markings of a deeper shade. The hood is curiously detached and distinct. It is not a very showy plant, but a useful addition to the hardy border.

Elizabeth, N. J.

J. N. Gerard.

Cultural Department.

Notes on Shrubs.

THE two or three species of *Styrax* in cultivation are well worth a place in all gardens of any extent, and it seems surprising that these pretty flowering shrubs are not more generally seen. They do not appear to be commonly known, and one rarely finds them outside of a botanic garden, a nursery or an enthusiast's collection. It may be that they have not won greater popularity because the flowers

do not endure very long or because they are largely hidden by the foliage. The habit of the shrubs is often rather open and straggly, but the foliage is clean and glossy, and, apparently, they are not liable to any serious disfigurement by insects or fungi.

There are two species of these shrubs to be had from nurseries, the Japanese (*Styrax Japonica*) and the American (*S. Americana*). Both are quite hardy in this climate if planted in good well-drained soil and not too much exposed, but if there is any difference in hardiness it seems to be in favor of the Japanese species. This is also the most showy and best worthy of cultivation. Its flowers, each composed of five large ovate petals, are something over an inch across, are of the purest white color, and are borne singly on slender stalks about three-fourths of an inch in length. They hang along the under side of the branches and produce a very beautiful effect, especially if the stems are tall enough to allow the blossoms to be seen from the under side of the somewhat horizontal branches. A serious detraction in the value of these flowers is that the whole corolla easily and soon becomes detached and falls in a single piece while yet looking pretty and fresh. The corollas carry the stamens with them, and after a heavy rain the ground is generally thickly strewn with the blossoms. The plant comes into good bloom here about the middle of June.

Less showy and handsome than the Japanese species is our native American one known as *S. Americana*, which is indigenous from Virginia southward. Its flowers are produced at the same time as those of the Japanese species, and apparently quite as abundantly. But they are much smaller, the petals being quite narrow, and they assume a strongly recurved position instead of remaining flat and horizontal like those of the Japanese species. They are also borne on shorter stalks, which renders them less graceful. The flowers of both have a sweet but delicate fragrance. Fruit is freely produced, and has something of the appearance of the dry little fruits of Linden-trees, being roundish and quite bony and with the calyx persisting at its base. The *Styraxes*, or *Storaxes*, as they are sometimes called, may be grown either from the seed, that grown here being quite good, or by layers or cuttings of the green wood. Layering is probably the easiest mode by which the amateur may obtain one or two new plants from one already established. As the seeds are dry and bony, they should either be sown as soon as ripe or they may be kept in a box with moist sand and subjected to the action of frost over winter and sown the following spring. Either of these *Styraxes* may grow and thrive if grafted on stocks of the Snowdrop or Silver-bell-tree (*Halesia tetraptera*), to which they are closely related botanically. The *Halesia* freely produces good seed here, and young plants for stock may be easily raised.

The recently introduced Japanese and Chinese *Viburnum dilatatum*, which was figured in the last volume of *GARDEN AND FOREST* (p. 150), has again flowered profusely, the blossoms being in most showy condition a day or two later than the middle of June. As a flowering shrub this might be called pretty, but it is hardly entitled to any more consideration for its inflorescence than our common Arrowwood (*V. dentatum*), whose flowers appear about the same time, or than the European Wayfaring-tree (*V. Lantana*), which blossoms somewhat earlier. The flowers are not very long persistent. *V. dilatatum* is to be valued most for its bright red or somewhat orange colored fruit in autumn, and for its late persisting yellowish autumn foliage.

Of the more showy *Viburnums*, those with large sterile flowers in addition to the perfect blossoms, we have no aboriginal kind which surpasses our own High-bush Cranberry (*V. Opulus*) in abundance and beauty of bloom in early June. More beautiful than this in its blossom is the Hobble-bush or American Wayfaring-tree (*V. lantanoides*), a rather common plant in nature, although it must be considered very rare in cultivation. This is much the earliest of all *Viburnums* to

blossom here, the first flowers on cultivated plants in the Arboretum opening as early as the 29th of April, while the sterile blossoms were conspicuous for some days earlier. The flat cymes of flowers of this species are broader than any other we know, and should a "snowball" form of this ever be produced it is likely to form an enormous cluster. Not the least interesting character of the Hobble-bush is the very large size of its thick, rough leaves, which always excite admiration, and which, when growing in the sunlight, soon take on a bronzy or purplish lustre. That a "snowball" form of this may be produced in the course of more general cultivation seems not unreasonable when it is considered that the three other species in general cultivation, and which bear showy sterile flowers in a natural state, have all given forms of the snowball character. These are our native Cranberry-bush, already alluded to, a native of Europe and Northern Asia as well as of our own coun-

as affect the common Snowball in almost every garden and cause the leaves to become wrinkled and twisted, not only to the disfigurement of the plant but to the detriment of its health, to such an extent as to interfere with the perfect development of its flowers. Applications of whale-oil soap will destroy these Aphides, but it has to be very thoroughly applied to be effective, because the distorted leaves offer secure hiding-places from all ordinary showerings or sprayings. When one of these shrubs is clean and well its flowers are carried with singular grace.

Arnold Arboretum.

J. G. Jack.

Indoor Work in July.

WORKING under glass is not an unalloyed pleasure during the midsummer season, but many of the finest stove-plants require attention if they attain their best estate even though the cultivator may find the temperature somewhat



Fig. 57.—Lumbering in Bear Meadows, Centre County, Pennsylvania.—See page 314.

try; the Japanese species, the double form of which has for some time been known in our gardens as *V. plicatum*, and the less common and less hardy Chinese species which bears the name of *V. macrocephalum*.

It is a curious fact that the wild-flowering type of *V. plicatum*, bearing cymes containing both showy, sterile and the small perfect flowers, has only been recognized in American and European gardens within a very recent time. It is known to botanists as *V. tomentosum*, and, like the High Cranberry-bush, its flowers are much more graceful and pretty than are those of the snowball forms. Nevertheless, the latter have come to be a necessity in all gardens. Of the two the Japanese Snowball is by far the best, because, not only are its blossoms handsomer and in finer clusters, but they endure twice as long in good condition as those of the common Snowball of our gardens. What seems to be a still greater advantage is that the clean dark green foliage of the plant seems to enjoy a singular immunity from attacks of Aphides and other insects, such

uncomfortable. This is the season of most active growth for many foliage plants, and there is, therefore, a certain amount of potting to be done all through the summer, in addition to the general overhauling that has been given in the spring; and while the growth of the plants is active, that of various insect pests is equally so; constant watchfulness is therefore needed since it is much easier to rid the stock frequently of a few insects at a time than to rid them of vermin after they have become badly infested. Some of the tender-leaved subjects, such as *Cyanophyllum magnificum* and *Sphærogyne latifolia*, are frequently attacked by mealy bugs, and in such cases very careful handling is needed, for the least bruise given to the young foliage when it is expanding will permanently disfigure it.

A camel's-hair brush is the most effective weapon to use on such plants for the removal of mealy bugs, and unless used very roughly it will seldom injure the young leaves. The plants above noted are among those requiring a rather high temperature and moist atmosphere to encourage their full development, but when this condition is attained, their beauty fully repays for the care given. Plenty of pot-room also should be given to these plants, and a light, rich compost,

and it should be remembered also that the soil should not be rammed very hard in the pots, and that the pots should be well drained.

Caladiums should now be in full growth, and if fine specimens are desired they should be potted on into large-sized pots or pans before the roots become stunted. A liberal quantity of dry cow-dung should be used in the potting soil, and, as soon as the pots become well filled with roots, an application of liquid-manure about three times a week will improve both the size and coloring of the foliage. And here may be an appropriate place to say that no collection of Caladiums is complete without *C. argyrites*, whose small, silvery-marked leaves are admirable either on a specimen plant or for cutting to use in table decorations.

One of the handsomest stove-plants of recent introduction is *Phrynium variegatum*, and though it grows best in a warm moist house, yet it seems to have enough endurance to stand very well for table decoration. It may be readily propagated at this season by means of cuttings formed from the young shoots or suckers taken off below the surface of the soil, which will soon form roots when placed in sand in a warm house. It is not too late to put in cuttings of *Azalea Indica*, though when the weather is very warm such cuttings require some care to guard against damping-off. The cuttings should not be taken from plants that are standing outdoors for the summer, for such growth is too hard to root readily.

The best wood for *Azalea*-cuttings is found in the form of soft young shoots from two to three inches in length, and taken off with a heel of the older growth attached, these being inserted in pots filled very firmly with light sandy soil, peat being preferable for this purpose. The pots should be plunged in a propagating-frame where they can be given some bottom-heat. The cuttings should not be exposed to strong sunshine, for if they are allowed to "flag" they seldom recover enough to make roots.

Many members of the *Gesneraceæ* help to make the greenhouse bright at this season, among which the *Gloxinias* are very prominent, and various *Gesneras*, *Tydias*, *Achimenes*, etc., vie with them in beauty and brilliancy of coloring. It should be remembered that all the plants of this family enjoy good living—that is, they should be well supplied with manure in the compost in which they are potted, and when the flowering period begins liquid-manure may be added quite freely.

Holmesburg, Pa.

W. H. Taplin.

Actinidia polygama.

WHEN visiting the Amherst Agricultural College recently, Professor Brooks pointed out two fine specimens of the true *Actinidia polygama* growing on his dwelling-house, which he brought home with him on his return from Japan after a twelve years' sojourn there. It appears that the species of *Actinidia* now in commerce, and called *A. polygama*, is *A. arguta*, a very different plant from the one here noted. *A. arguta* is a rampant grower, and when used on a dwelling-house soon shuts out all sunlight from the piazza, and then gets on the roof and displaces the eave-troughs in a way which renders continual cutting necessary to keep it within reasonable limit. When this plant was introduced into this country it was said that cats were very partial to *A. polygama* in Japan, but the American cat was found to be sublimely indifferent to *A. arguta*. The true species, however, Professor Brooks has found it necessary to protect about the base with wire guards, for, in his words, it out-Catnips Catnip as an attraction for these animals. This may be a peculiar way of verifying a species, but the evidence certainly seems admissible and to the point.

In appearance the plants have nothing in common. *A. arguta* is a vigorous grower, with heart-shaped foliage of a deep olive-green, and flowers that are polygamous, a feature which, perhaps, first caused the mistake in nomenclature. The plants of *A. polygama*, which Professor Brooks has, are not rampant, but vigorous enough for any decorative purpose where a twining plant is required, the principal beauty being in the foliage, which is for the most part of a beautiful pea-green, while about one-third of the foliage is suffused (not variegated) with an indescribable silvery lustre, often covering the whole leaf, but sometimes only a part of it, and beginning always at its base. When I first saw the plants with the sun shining on them and glistening in the light, I was compelled to ask if this was caused by the sunshine, but was soon shown that the color was permanent. Were the whole of the foliage silvered in this way the effect probably would not be half as beautiful.

The flowers of *A. polygama* are about the size and color of

an Orange-blossom, but with a sweet perfume peculiarly their own. It is much to be regretted that the nomenclature of Japanese plants gets so badly mixed up, as years will pass before the names of the *Actinidia* can be trusted as correct in catalogues. The plants of Professor Brooks are certainly of great ornamental value.

Among other things brought over by the Professor are a fine young specimen of the Japanese Lacquer-tree (*Rhus vernicifera*) and many beautiful varieties of Japanese Maples, especially the cut-leaved kinds. Some very dwarf forms of *Retinosporas* were here also—peculiar reminders of a peculiar country.

South Lancaster, Mass.

E. O. Orpet.

The Garden in June.

WHEN a garden has been stocked with a selection of plants to produce a succession of flowers, their blooming furnishes continual surprises. As the weeks advance, each with its varied flowers, it sometimes appears as if the flowers were spontaneous productions, so little care have the plants received. At the end of June the Larkspurs, Foxgloves, Hollyhocks, Lychnis, Coreopsis, Perennial Peas, Campanulas, Spiræas, Ascension and Golden-banded Lilies and Clematis are brightening all the borders with a wealth of bloom, together with the flamboyant Japanese Irises, and the dainty *Gypsophila* and *Galium*. The first of the annuals are in the flush of beauty. These are by no means ordinarily spontaneous flowers, except those like *Calliopsis*, Poppies and annual *Chrysanthemums*, which are usually self-sown. The charming Shirley Poppies, with their delicately formed and colored flowers, now cover the nakedness of the early bulb-bed.

Sweet Peas are now in full vigor. These plants have always bothered me, my soil being heavy and hard to work early in the year, when the seeds should be planted, besides which, as work is pressing at that time, they were often neglected. By planting seeds in thumb-pots in the cool house I have had much more satisfactory results. The pots were plunged in the earth slightly, and the roots penetrated the soil. In May they were carefully lifted when the tops were a foot high, the pots were broken off, and they were transplanted outside. Owing, perhaps, to their being planted at a suitable distance apart, they have grown away better than any plants I have raised outside, and are producing first-rate crops of flowers. Blanche Ferry (it is hard to get too many pink flowers) and pure white Peas cover my wants in these desirable plants. The perennial Peas (*L. latifolius*), white, pink and red, are ornamental low climbers with a profusion of flowers, valued by some for cutting. They are strong plants, needing care to keep within proper bounds. Mr. Orpet's note on *Lathyrus tuberosus* reminds me that there are a number of these strong plants which we sometimes feel like posting in the garden *Index Expurgatorius*, yet which, after all, should have only a note of warning attached. A plant ruthlessly destroyed in one garden may be highly valued in another. A list to be commended to those people who love flowers, but for whom they will not grow, might contain such things as these. It would be curious and interesting to see a garden filled with plants which are difficult to exterminate when once they had gained a foothold.

Hardy Carnations are now in full flower. It is interesting each year to sow with the annuals seeds of Carnations of a good strain. When small they can be transferred to the border, where they will prove reliably hardy the first winter. They bloom profusely, and will at least furnish a profusion of flowers for cutting, and sometimes there will be kinds to save. After the first season the stems become hard, and they are apt to be destroyed by winter frosts. The border Carnations, mostly English strains, are not safe plants to leave out in this latitude, especially when well grown, and it is well to pot them in the fall and keep them in a frame. Such kinds as the old Crimson Clove and its dwarf variety, Paul Engleheart, Souvenir de Malmaison, Mrs. Reynolds Hole, etc., are well worth the care required. Mrs. Reynolds Hole is an especially beautiful and distinct flower of an apricot shade. The popular Malmaison is perhaps better for the protection of glass at all times, as its massive flowers are rapidly rotted in wet seasons.

In the water-garden this is the time of the hardy *Nymphæas*, though nothing there makes such rapid advance as *Nelumbium speciosum*, whose wonderfully beautiful leaves expand almost visibly. Some *Callas* which had been kept growing, but rather dry in the greenhouse during the winter, were plunged in the tank in the spring, and prove rather interesting. The foliage is much shorter and sturdier than under glass, and the flowers have come freely, and prove very lasting. They

will be ornamental probably till the *Sagittarias* commence to flower with a change of effect. Of the pink *Nymphæas* there is now a nearly complete series through the entire gamut of color between the slightly tinted *N. carnea* to the deep carmine-rose of *N. odorata exquisita*. This last has a color tone in the way of *N. rubrum*, but lighter. Of the various white *Nymphæas*, among which there is a wide difference in form, I am inclined to give the palm for beauty to *N. Marliacæ albida*. This is a flower of the largest size, with petals somewhat narrower than those of *N. alba*. The color is a lustrous silvery white, very distinct and beautiful.

Elizabeth, N. J.

J. N. Gerard.

The Importance of Microbes in the Cultivation of Plants.

MONSIEUR CHARLES NAUDIN, in an article in the *Revue des Sciences Naturelles*, gives a plausible explanation of the frequent failures which occur in growing exotic plants. Even though the conditions surrounding the plant may apparently be favorable to its development, it often seems that an essential element is wanting. Monsieur Naudin considers this element to be, in a great many cases, the fertilizing microbe which is found in the soil in which the cultivated species originally grew.

Several facts support this theory. He cites cases relating to certain species, in which it has been impossible to grow the plants, whatever the composition of the soil in which they are placed. His own experiments, which were carried on with seedlings, strongly incline him to the belief that the presence of certain micro-organisms in the soil is an indispensable factor for the development of many plants. It is well known that fertile soils swarm with several kinds of microbes, and it also seems that certain plants are infested with microbes peculiar to them. Monsieur Naudin says that these may be transmitted from one generation to the next, and even though the plant may not die outright, its growth may be checked and its life shortened, if certain lower forms of life are not present.

Cornell University.

E. G. Lodeman.

Correspondence.

New England Country Houses.

To the Editor of GARDEN AND FOREST:

Sir,—Your correspondent, S. P. S., who does me the honor to agree with me in a taste for warm colors in house-painting, suggests that stone and brick would in the end be more profitable, as well as picturesque, building materials than wood, which requires frequent painting and occasional renewing. While agreeing with the writer wholly as to the more interesting and picturesque character of solid construction, I still think that there are serious objections to using brick and stone for houses in a New England village.

These materials, so pleasantly cool in a continuously hot summer climate, are apt to make a dwelling damp and cold when our variable wind whisks round suddenly to the north-east after days of tropical heat. So long as the weather is cool enough to permit a light furnace fire, stone houses are very agreeable, but the torrid temperature of our summer days never fairly warms through a thick wall, and the change from out-of-doors is often chilling and uncomfortable on a day when a wooden house would prove just pleasantly cool. To be sure, a fire on the hearth can be easily lighted, but it requires an army of servants to attend to open fires in many rooms, and the consequence is that one often goes unwarmed rather than take the trouble to attend to the falling logs, which it is unsafe to leave, and the consequent chill received is unwholesome. There is an undeniable dampness about brick and stone dwellings here, which shows itself in the rust on steel and iron objects, in mold on neglected shoes, in spots on the walls of shut-up rooms, which proves that they are seldom thoroughly dry without artificial heat. Even in the brick-ended houses, with wooden fronts and backs, common in some old-fashioned towns, there is the same trouble from the collection of mold and rust even in houses not shaded by trees. This is not experienced in wooden houses unless in very wet and shaded localities, which shows that there is a freer circulation of air in frame-dwellings, and a healthful dryness even in shut-up portions during the summer.

Sea-side buildings of stone are apt to leak around the windows during a driving storm, so that much damage is often done even in an apparently well-built house, and in cold winters the pointing with mortar is apt to crack and let in the rain.

Severe seasons are also apt to throw rubble-work wholly out of place, and to occasion a great deal of damage in houses built of it. Moreover, is rubble-work in itself proper material even for the lower story of a house? To me it always seems to wear an air of insecurity, as if it might fall to pieces at any moment, especially when invisibly pointed, as is now the fashion, so that there is apparently nothing to hold the round stones together.

When we see what freaks the lifting of frost will play with unmortared walls of the most massive construction, throwing them down till huge gaps are visible in them, one may well hesitate to employ anything that looks as if it might be liable to that sort of upsetting when the mercury goes below zero. Of course, the walls can be constructed to stand firmly, but anything which looks insecure is architecturally faulty, however picturesque it may be. Frost and rain certainly do queer things in the Yankee climate, which shows a special animosity to outdoor plaster of all kinds, and when a high wind blows, almost any one feels more comfortable in something that may possibly blow away all in one piece, but will certainly not tumble into fragments like a house of cards.

But, after all, the very serious objection to brick and stone is in the immense difference in the first expense of building with these materials, especially outside of a town where workmen are easily to be obtained; for in the country only a few men understand the business, one or two bricklayers usually sufficing to a village, and as many stonemasons having charge of the construction of cellars. In any case an outside stone wall costs at least twice as much as wood. As to painting, a brick house has to be oiled or painted about as often as a wooden one, to keep the water from driving through its porous structure, and the additional pointing which must be renewed occasionally in white-lead, also painted, is another item of expense. Also, stone and brick buildings have to be constructed on a much larger scale than wooden ones, to admit of an air space between the outer wall and the lathing to prevent dampness constantly penetrating the interior. Another point is the transportation of the heavy materials, which is very expensive compared to the transportation of wood, even if the stones are close at hand, as any one who undertakes to lay a few score feet of mortared wall of stone on his own land soon learns to his concern.

All these objections have weight with those to whom expense is an object, and there are few people who live all the year round in the country who do not have to count the cost of their houses with considerable care. The melancholy result of such calculation reveals that the picturesque is invariably the most expensive as well as the least durable of ways to build. Numerous gables represent places for leakage; stone and brick laid in mortar require close attention in our bitter climate, and the angles and recesses, so charming in a wooden house, render it the more difficult to keep in order. In short, true economy in building, both for durability and cheapness of maintaining and heating, was obtained by our colonial ancestors with their square uncompromising domiciles; and to this day these frame-dwellings, with such modification of their bareness of outline as may be obtained by verandas and bay-windows and skillfully placed railings, still remain the most profitable houses to build, and the least expensive to keep in order in New England, where the accessible stone is almost always very difficult to cut and handle, unlike a lime-stone or gneiss, which latter flakes off in a way that makes it ready for use without undue labor.

Hingham, Mass.

M. C. Robbins.

A Foreigner's Impressions of America.—III.

To the Editor of GARDEN AND FOREST:

Sir,—My first impressions of America had left me with a vague sense of perplexity at the inconsistency between the glorious woods and the neglected front yards—my spring impressions only served to deepen this feeling. I did not feel it so much at first. It was so delightful to be out of town again, and the charm of Bean-stalk Land, of a new country, more open and free and bright than our ordinary European suburbs, was upon me strongly. The Boston suburb I had chosen is a very lovely one, rural and dignified. The older houses retain their original extensive grounds, and in the newer streets near the station the houses have not yet begun to crowd each other. There were but few fences, but that only seemed in keeping with the hospitable, old-world character of the large places, while the smaller grounds afforded full views of sparkling young grass and Peach-trees in bloom, entirely in harmony with the strange beauty of the keen spring air.

As April deepened into May, however, with the first glory

of the young grass, the ethereal beauty of the Peach-blossoms and Pear-trees departed and was succeeded by an exuberance of teeming life in the woods and fields that seemed to call for a corresponding joyfulness in the gardens. As my walks extended to long tramps and drives about the country and visits of curiosity to other suburbs of Boston, I sadly missed the English gardens. Had I never gone into the woods I might have thought that this beautiful land, with its abundant sunshine, was one where flowers did not thrive. But the woods had quite a different tale to tell. The variety of trees and blossoming shrubs and decorative flowers—many of them looking to me as if they had strayed from some garden—filled me with ever-increasing wonder and delight; and yet I knew that the woods which were accessible to me did not give me any adequate notion of the resources of New England woodlands. The few really charming gardens I saw only served to increase my perplexity by showing me what might be done in this favored climate, which seems to command the resources of both the North and the South. I remember one garden in particular, a bower of delight, with magnolias and fruit-trees, standing about in beds of strawberries, and holding up their crowns of blossom against a distant background of picturesque White Pine, while clusters of English Primroses nestled under the arch of a vine-covered trellis, suggestive of Italy. The Wistaria grew as luxuriant as it ever does on the shores of the lake of Como. The herbaceous borders were broad bands of solid color and splendid growth, and all this was planted on a slope that helped to give beauty to the perspectives, and was surrounded by a sturdy fence that made the charm complete. This garden and a few others like it were the luxuries of wealthy amateurs, it is true, but I do not see why the same thing could not be worked out on a smaller scale by less-favored mortals in suburban homes.

At present the ideal seems to be grass and a few shrubs or trees. A few words first as to this ideal. Such as it is, it might be much more artistically treated than is now generally the case. Even admitting that medium-sized suburban homes are generally deserted during the summer, and that for them it is well to have lawns, terraced or not, planted with some shrubs and trees that require no special care in summer, and possibly with a bed or two of spring flowers, it does not follow that these shrubs and trees might not be selected with taste and care. It ought to follow that people should put at least as much care into the choosing and arranging, once for all, of their shrubs and trees as into the choosing and disposing of their furniture. One belongs to the house as much as the other. An expensive house on a poor plot of land looks no better than a bunch of choice grapes on a coarse platter. Pretty surroundings, that give one something delightful to look out upon at all seasons of the year, are as important for the drawing-room as the furniture, and, indeed, if the question of cost should be urged, I should say that a choice shrub or two more in the garden, and a fashionable knick-knack the less in the parlor, would decidedly improve the parlor.

It has not seemed to me that many of the dwellers in suburban homes held this view of the matter. I have not observed that the women who go to art-schools, museums and lectures with great assiduity, for the purpose of educating their taste, have taken any pains to put the art-knowledge they have acquired to profitable use in their gardens. Looking over Japanese prints would teach them, if their own observation had not done so, that a Peach-tree in bloom would look all the better for having a background of White Pine, or that one or two detached plants of Iris, showing the beautiful growth of the flower, look better than a whole square patch of them, while everything else that they really saw and understood would be teaching them minor details about grouping and detaching, about line and color, which might all be applied in their own gardens. There is no working palette more varied and delicate than that offered to the garden artist by spring in New England, with the tender pinks, pure whites and golden yellows of the flowering shrubs and trees, the splendid dark foil of the White Pines, all the golden and bronze greens of the young leaves, and the gorgeous, distinct note of the Red Maple. A woman with whom artistic tastes had become second nature, and were no longer a mere fad, might, if she cared, convert even her little fenceless plot of grass and shrubs into a thing of beauty during the seasons of the year—spring and autumn—that the family spend in their suburban home.

A woman of artistic tastes would not long be satisfied with mere grass and shrubs, especially if her grass was terraced. A bare, terraced, grass-laid yard around a handsome house is a double anomaly. Not only does a fine house call for fine grounds, but any arrangement in terraces calls for a formal garden. Many of these terraced yards have a strip of peren-

nials along one of the walks, it is true, but one bed on one side is not enough to carry out the idea of symmetry, irresistibly suggested by the terraces and the straight gravel walk leading from the sidewalk up to the house. The least one can do is to accentuate this walk and the small terraces themselves by shrubs or plants in pairs, either planted in pots or direct in the ground, as the case may be, and large or small, costly or simple, according to the taste and means of the individual. For wealthy suburban homes, where the people can afford to make an arrangement with a florist, I can think of no more beautiful June decoration than an avenue of the shrub Wistaria, with its indefinable air of distinction. Indeed, in this favored clime, there does not seem to be any kind of spring or early summer plant, shrub or tree, that lends enchantment to other lands, which is not available for purposes of gardening here, while the native woodlands themselves are rich in varied and beautiful growing things. But the passion for gardening, which would run riot in all this abundance, does not seem to exist, at least among the residents in the suburbs I have seen. Why is this? I wonder. Do not Americans love and appreciate their own beautiful woodlands? How can they see them without loving them, and how can they love them without trying to transplant some of all this woodland wealth to their private grounds and add a new charm to their home-surroundings?

Milton, Mass.

Cealia Waern.

Periodical Literature.

The Forms of Trees.—I.

The following extracts from a paper by Gustav Eisen, read before the California Academy of Science on the 15th of last February, and reprinted in part in the April issue of *Zoe*, are interesting to all students of trees:

"A traveler," he tells us, "from the arctics, or from the high wooded mountains in any district of the world, cannot but be impressed by the different forms which trees and shrubs assume in the respective regions. Nowhere is this difference in form more striking than between the trees inhabiting the Pine region of the Sierra Nevada and those which grow on the lower plains in the interior valleys." . . .

"In the high Sierras, for instance, in that region below the snow-line, where the Pines and Spruces dominate, we find that almost every shrub and every tree resembles the other in a general way. The trees are tall and erect, with a central undivided trunk, from which the branches slope down toward the ground. The shrubs, again, are low and depressed, spreading out horizontally, forming dish-like masses, hugging the ground instead of seeking the sky. A few thousand feet further down in the region where the evergreen Pines and Spruces have ceased, the trees as well as the shrubs begin to assume a different aspect. The trees in this region are not so erect, their branches are less sloping, their crowns extend further, the trunks are often branching; there is, in fact, a decided difference in their general form. The shrubs, again, are more erect and bushy, forming often dense masses, which show little or no tendency to flatten out.

"If we again follow the vegetation further down to the plains the change in form is yet more pronounced. The trees are here, as a rule, branched close to the ground, their crowns are wider and spreading, the branches drooping and often sweeping the ground. The general form, which in the higher Sierras was that of an elongated pyramid, has here changed and become globular. We may call these, respectively, the Spruce form and the Oak form. In the higher mountains we rarely meet with the Oak form, at least not in evergreen trees, and on the plains the Spruce form is equally rare. There are some exceptions to this rule, but they are few, and in no way interfere with the theory which I will here set forth and endeavor to prove. Before we dwell upon the causes which have been and yet are operating in creating and maintaining these characteristic forms of trees, it is necessary to first consider those causes which combine in effecting a change in the form of trees generally.

"Nearly every visitor to the wind-beaten and open sea-shore has noticed the characteristic forms of trees and shrubs growing there. The shrubs spread close to the ground, the trees lean toward the interior, their crowns spread out horizontally, and their branches are thorny and knotty and continually bent. Such a sight is common everywhere in exposed places. In sheltered localities inland these same varieties grow upright, their crowns become less horizontal, the branches less twisted, and the same shrubs, which on the sea-shore hug the soil, grow here straight and send out slender branches. Even to the least observant the force that operates here and causes the

trees and shrubs to so change their shapes is the wind. When we see such trees and shrubs painted on a canvas we know at once that the landscape is a wind-beaten one, and that the vegetation is struggling against a force which is trying to destroy its foothold.

"But while the wind is especially active on the sea-shore in changing the natural, or perhaps the original form of the trees and shrubs, it is similarly effective to a lesser degree in any locality at all exposed to winds. The interior plains, the cliffs on the sides of the desert, the high mountain-peaks, the elevated plateaus, the table-mountains, the slopes of the more sheltered sides of islands—in fact, everywhere—may the power of the wind be perceived.

"The effects of the wind may be temporary or permanent; temporary, if the plant retains its original form and outward appearance when removed from the windy region to a sheltered one. This is by far the most common effect, and especially refers to shrubs. Many instances may be cited, but I will only mention one. *Baccharis pilularis*, which grows everywhere on the coast around San Francisco, clings typically to the soil and sand-hills where exposed to the wind, while on the north side of Tamalpais, where the shelter is perfect, and even in the Oak-scrub of Golden Gate Park, it assumes an erect form. So different is the outward appearance between these two forms that the former has been described as a distinct species, *B. consanguinea*.

"Similarly on nearly all our high mountain-tops we meet with Scrub Pines growing in the crevices and clinging to the rocks like real coverlets of verdure. But the same species may be found farther down in the elevated valleys growing erect with sloping branches and undivided trunks. Such instances are common. I may, however, here especially recall the dwarf and scrubby *Pinus monticola*, growing in the cañons on the slope of Mount Dana, while farther down splendid specimens are crowding the sheltered meadows.

"As an instance, again, where the effects of the wind have been partly permanent we may point to the Monterey Pine (*P. insignis*) and to the Monterey Cypress (*Cupressus macrocarpa*). Mature specimens of these varieties assume always horizontal crowns, even when growing inland, and only during their earlier growth do they show a tendency to grow erect like most species of Pines or coniferous trees generally. We may presume that if the evolution of a species is accompanied by this continued wind force the latter will, to a great degree, mould the outward form of the species. If, again, the evolution of a species takes place under various conditions of wind and calm the form of the species will be variable, according to exposure.

"The effect of the wind, while apparent everywhere, and while found in every climate and in every country, is, however, not the most powerful agent in shaping the forms of trees and shrubs. The snow which part of the year covers vast territories, often to a depth of thirty or more feet, has a great influence upon the forms of all plants which are exposed to it for a longer or shorter time.

"As the effects of the snow depend chiefly upon the resistance to pressure, it will be seen that evergreen and deciduous trees must be unequally affected. The foliage of the evergreens offers much more resistance to the snow than do the bare limbs of trees and shrubs which during the winter season are void of leaves. In some horticultural districts, where snow but seldom falls, and where, accordingly, such trees as Olives, Oranges and Lemons are cultivated successfully, an occasional fall of snow may do, and has in many instances done, considerable harm. We know that when the snow lodges on the evergreen and upright limbs of Orange-trees, these limbs become so heavy that they break down, more or less ruining the trees." . . . "Those limbs which point upward do not yield readily under the pressure of the snow, and trunks which are repeatedly forked will, if the pressure is heavy enough, split lengthwise. In case the trees in question had possessed downward sloping limbs and an upright, undivided or standard trunk, the effect of the snow pressure would have been less dangerous; the limbs would have yielded to their snow burden, which, when melting, would have slipped off, leaving the limbs free, and the undivided trunks would not have split, and the trees would have escaped without injury. If such snowfalls were frequent and regular, only such varieties could be cultivated as were possessed of downward sloping limbs and upright trunks. All trees shaped otherwise would gradually be ruined and their cultivation become impossible. These last remarks refer only, or at least principally, to evergreen trees. If the Orange-trees, which we gave as an example, instead of being evergreens were deciduous—that is, presenting only bare limbs in the winter, like Peaches, Apricots and Pears—the pressure of the snow would not have injured them, at

least not by breaking their limbs and splitting their trunks, and their cultivation would not necessarily have been abandoned. If we consider a forest instead of a horticultural district, we will find that the conditions are there very much the same. The yearly snowfall, if only heavy enough, tends to break down and destroy all wild evergreen trees which do not possess a form suitable to resist the heavy snow mantle. Trees which would thus suffer would be all evergreen trees, with spreading crowns, such as Live Oaks, Laurels, Madroña, certain Pines, such as Monterey Pine, Digger Pine (*Pinus Sabini-ana*), Italian Pine (*P. Pinaster*), Lebanon Cedar, and the hundreds, if not thousands, of other evergreen trees which inhabit regions below the regular snow-line.

"Nature thus eliminates from snow-visited forests all evergreen trees which are not suited to resist the pressure of the snow. On the contrary, the snowfall makes it possible for all those trees to live and survive which, through their outward form, are able to easily shed the accumulated snow. As regards deciduous trees, no such upright trunks and sloping branches are necessary, as the bare limbs do not accumulate the snow or suffer under pressure. If the above is true, the forests of snow-visited districts will be found to consist of only such varieties of trees as possess the requisite form—that is, evergreen trees with upright, undivided trunks and downward sloping branches, as well as of deciduous trees of various not especially characteristic forms. Upon examination this will also be found to be the case.

"A visit to the high Pine-forests of Sierra Nevada shows us just such forests. Nowhere is the snowfall heavier and nowhere is the characteristic form of the evergreen trees more pronounced. This is also the case in all other snow-visited regions where forests are at all able to exist. Where the snowfall is the heaviest and lasts the longest all evergreen trees, at least during a certain period of their life, possess the required pyramidal form. Evergreen trees of any other form would in their struggle for existence have little or no chance to compete with better-equipped neighbors. It follows, also, that the less the snowfall the less characteristic will prove the pyramidal form in all evergreen species, while lower down the mountains on the warmer slopes the pyramidal form may be expected to be entirely absent.

"To refer to our nearest high mountains, the Sierra Nevada, we find thus on the snow-belt such trees as *Pseudotsuga taxifolia*, *Abies amabilis*, *Pinus Lambertiana*, *Libocedrus decurrens*, *Sequoia gigantea*, etc. All these show in a characteristic way the pyramidal form, the snow-shedding branches and the undivided trunk. We find in this region no large Live Oaks, nor any large evergreen trees of globular or goblet shape. But in the region immediately below the heavy snow-belt the characteristic pyramidal shape is entirely absent. The forms of the evergreen trees are here evidently regulated by other agencies. In this region we meet with several evergreen Oaks with large crowns, spreading branches and repeatedly divided trunks. The Pines also, like *P. Sabiniana*, are characterized by their forked trunks, their upright limbs, and by their general resemblance to deciduous trees. As regards shrubs of all kinds, they are hardly less influenced by snowfall. In the snow-visited forests, at least, the evergreen shrubs show a low depressed form, sometimes spreading out like dishes on the ground. Other species, again, like the Manzanitas, possess repeatedly zigzag bent limbs especially adapted to resist the pressure of snow and wind. Such zigzag form is also possessed by the branches of trees, greatly assisting them to resist outside pressure of any kind. Thus, while the lower or central branches of most of the Pines in the snow region slope downward, the upper limbs, which are naturally less exposed to snow pressure, assume a horizontal position, but are compensated by being repeatedly bent and furnished with heavy knees. Such limbs are generally seen in the various species of Pines, such as *P. Lambertiana*, *P. contorta*, *P. Jeffreyi*; also in *Sequoia gigantea*, etc., while they are almost absent in the Spruces and Firs, the sloping elastic limbs of which continue to the tops."

Notes.

The Clarke Memorial Medal was recently bestowed by the Royal Society of New South Wales upon Mr. Thistleton Dyer, director of the Kew Gardens, in recognition especially of the valuable services which he has rendered to the agricultural and horticultural interests of India and the Colonies.

The Japanese *Ligustrum Ibo* is still too rarely seen in our gardens. It is one of the very hardiest and most desirable of the shrubs of its class, and just now it is covered with its short drooping racemes of pure white flowers which are so fragrant

that they perfume the air in all the neighborhood of the plants. Its free growth and graceful habit, in which it excels other Privets, make it beautiful, too, after the flowers have disappeared.

At a recent meeting of the Société Nationale d'Horticulture de France, Monsieur Cornu exhibited the yellow-flowered Pæony, raised from seed collected in Yunnan by Delavay, to which Monsieur Franchet has given the name *Pæonia lutea*. It is a small-flowered species of no ornamental value, but interesting from the unique color of the flowers and the possible influence it may exert in the creation of a new race of yellow-flowered garden Pæonies.

Mr. C. L. Mann, of Milwaukee, writes that an Elm-tree cut last winter at Sutton's Bay, Leelanaw County, Michigan, scaled 6.487 feet, board measure, by Doyle rule. The first eight feet of the trunk were cut off, and not taken out on account of shake, and a piece of the trunk further up had attached to it a burl about six feet in diameter, and six feet of the trunk were wasted to avoid the task of handling this. A deduction was made for defects in the first log.

The hybrid *Lælia* which was raised by Messrs. Sander & Co., of St. Albans, England, from *Lælia purpurata*, fertilized with the pollen of *Cattleya Mossiæ*, and named *Arnoldiana*, is now blooming in the collection of Mr. Hicks Arnold, of this city. The plant justifies all that was said in its praise when it was awarded a medal and a first-class certificate rather more than a year ago at a meeting of the Royal Horticultural Society, in London. Mr. Arnold's plant carries eleven flowers, and they show the good qualities of both parents, especially in the richness of their coloring, from the pale purple of the petals and sepals to the brilliant dark crimson of the lip.

Syringa Japonica, the great tree Lilac of northern Japan, certainly improves with age, and the large plants in the gardens of eastern Massachusetts, where this fine plant was introduced several years ago through the agency of the Arnold Arboretum, are better than ever this season, being covered with their immense clusters of creamy white flowers, which stand up boldly above the masses of rich dark green foliage. Among small late-flowering trees *Syringa Japonica* here at the north has no equal when once it is established in deep rich soil with sufficient room to insure the growth and ripening of its upright rather rigid branches which, when the plants are well grown, form a compact rather formal head. The largest plants in Massachusetts are now nearly twenty feet high and twelve or fifteen feet through the branches.

English fruit-growers are now compelled to compete with the most distant countries, for rapid transportation is making proximity to market a secondary factor in fruit-culture. A few years ago apples were first shipped from Australia to London, and this fruit was so much superior to that grown in England that the latter was, in some cases, practically driven from the market. This year Mandarin oranges have been sent to England from the province of Nagpur, in British India, and the fruit is of such excellent quality that it rivals the oranges grown in less distant countries. Peaches grown at the Cape of Good Hope have also been successfully shipped to London. They were sold in London early in February, the demand being strong. The first crate, containing 35 peaches, sold for 80 shillings. Such prices will be a strong inducement for further shipments.

The *Gardeners' Chronicle* has an interesting note about a Tulip-show which for sixty-seven years has been held at the Orange-tree Inn, Butley, a small village near Macclesfield, England. So popular is it with the Tulip fraternity that many admirers of the flower are attracted to it from Manchester, Macclesfield, Stockport, etc. The show is conducted according to all the old traditions: the flowers are staged in ginger-beer bottles in one room; in another sit the secretary and the exhibitors, and as the flowers are judged, stewards bring to the secretary the blooms awarded prizes; the names of the varieties and the exhibitors are entered by him in a book, and the proper cards affixed to them; they are then returned to the show-room and arranged on a sloping stage—like an old-fashioned plant-stage—placed at one end of the room, where they are on view for a few days, non-subscribers being "admitted on payment of silver at the doors." If any one would witness something of the old enthusiasm which stirs the Tulip-growing fraternity, they should pay a visit to the Butley Tulip-show. One curious proviso in the schedule of prizes is, that growers may be required to prove on oath the flowers they bring to the show were grown and bloomed by them.

At a recent meeting of the Torrey Botanical Club in this city one of the members described an interesting collection of New York plants, accompanied by many drawings, which he had been shown at the British Museum. The collection is in book-form and is prefixed by the following statement, written in New York in 1782 by F. von Langenheim, a captain in the Hessian army-corps: "This manuscript, which has never been printed, contains part of the Flora of New York, and was composed by a lady, the daughter of the Governor, Cadwallader Colden, well known for his botanical works, and a physician as well. This lady married a doctor of medicine, Farquhar, a Scotchman by birth, and she died soon afterwards. Some of the names are according to her father and according to Gronovius, and some are according to the Brandenburg Dr. Schœpff, who has read this work. The trivial names are according to Linnæus. This work is a remarkable one, because it is that of a lady who possessed such a love for botany that she learned Latin, and, judging by its nature, is so worthy and correct that it contains many, even minute, things." Governor Colden, the lady's father, was the author of *Plantæ Colden-shamiæ in Provincia Novæboracensi Americæ sponte crescentes quas ad Methodum Cl. Linnæi sexualem Anno 1742, etc.*, which in 1749-1753 was published in the *Proceedings of the Royal Society of Sciences*, at Upsala, as the earliest special contribution to the Flora of New York State.

Under the title of *Dictionnaire Pratique d'Horticulture et de Jardinage*, Monsieur S. Mottet has commenced the publication of a translation of Nicholson's *Dictionary of Gardening*. The value of the original work will be increased in its new form by various changes and additions which the translator promises with a view of adapting its contents to the climate of France and the methods of French horticulturists; and that special parts of the work may be treated in the most authoritative manner possible, and that cultures, especially French, may be properly treated, he has secured the co-operation of such distinguished experts as André, the Vilmorins, Bellair, Legros, Alluard, Dard and Mottet, whose contributions will be signed by the initials of the authors. The work will be completed in eighty parts, each of forty-eight pages, accompanied by a chromo-lithograph, a part being promised each month until the completion of the work—that is, at the end of six years. The price of each part is thirty cents, and subscriptions can be sent to the Libraire Agricole de la Maison Rustique, 26 Rue Jacob, Paris, or to Vilmorin-Andrieux et Cie., 4 Quai de la Mégisserie. The colored plates in the two parts which have already reached us are devoted to a group of Acacias showing flowering branches of four species, and to a group of *Anemone fulgens* and its varieties. The cuts, which give so much value to the original work, are reproduced in the French edition. Judged by the parts already before us, Monsieur Mottet's publication promises to be a substantial and valuable addition to garden literature.

Recent issues of German horticultural journals report wide and active interest in the proposed displays at the Chicago World's Fair. Meetings called in various places to awaken such interest and make practical arrangements for contributing have been largely attended; and at one held in Berlin, where not only local horticulturists but also those from distant towns were present, almost every person announced his intention of exhibiting. At this meeting the government grant of 10,000 marks for the assistance of exhibitors was voted far too small to cover needful expenses, as these would involve, for example, the immediate dispatch of an agent to remain in Chicago until the close of the exhibition; and it was therefore decided that all expenses in excess of this grant should be shared between the exhibitors. Since last January a committee has been actively at work in Hamburg; the contributions from this place will be particularly numerous; and a special trade-exhibition has been arranged for the month of September. At one time, German exhibitors were discouraged by a report that certain American firms had threatened by letter to withdraw their patronage from German firms should these exhibit at Chicago. But Mr. Mason, our consul at Frankfort, has now made public a telegram received from the director of the horticultural section in Chicago, which declares that there is "no truth in the rumor of a boycott," and has promised to investigate the sources of the rumor, and to recommend that, if such threats have indeed been made, those who made them shall themselves be excluded from the exhibition. Such a punishment would be none too great for conduct of so selfish, short-sighted and disloyal a sort; but we cannot believe that any American horticulturist has indeed been guilty of this conduct.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLES:—A Suggestion.....	325
The Terrace at Haddon Hall. (With figure.).....	326
Good Roads at the Columbian Fair.....	326
The Grafting of the Chestnut on Quercus Mirbeckii.....	<i>M. Naudin.</i> 326
Fairmount Park, Philadelphia.....	<i>Mrs. J. H. Robbins.</i> 326
Midsummer Shrubbery in North Carolina.....	<i>Professor W. F. Massey.</i> 328
Some Interesting Plants.....	<i>Mrs. Danske Dandridge.</i> 328
FOREIGN CORRESPONDENCE:—London Letter.....	<i>W. Watson.</i> 329
CULTURAL DEPARTMENT:—Notes on Shrubs.....	<i>J. G. Jack.</i> 330
Garden Carnations.....	<i>V. C.</i> 331
Hardy Herbaceous Plants.....	<i>T. D. H.</i> 332
The Water Garden.....	<i>J. N. Gerard.</i> 332
Armeria vulgaris.....	<i>V. C.</i> 333
CORRESPONDENCE:—Roan Mountain—A Summer Resort.....	<i>S.</i> 333
PERIODICAL LITERATURE:—The Forms of Trees.—II.....	<i>Gustav Eisen.</i> 334
NOTES.....	335
ILLUSTRATION:—The Terrace at Haddon Hall, Derbyshire, England, Fig. 58.....	329

A Suggestion.

A CORRESPONDENT, in describing in another column the beauties of Roan Mountain, in North Carolina and Tennessee, refers to the destruction of the forest in the valley of the Doe River, in the latter state. More than once in these columns we have alluded to the wealth and beauty of the southern mountain-forest, which no other forest of deciduous trees equals in variety, attractiveness and splendor. It is as wonderful in its way as the Sequoia and the Redwood-forests in California are in their way, and far more beautiful and interesting. On the slopes of the high mountains of Carolina and Tennessee the principal trees of the Appalachian forests attain their greatest size and perfection, and in a ride of a few hours, covering a rise in elevation of 4,000 or 5,000 feet, one may see growing in their supreme perfection the trees of the south, like the Magnolias, the trees of the middle states, like the Ashes, the Oaks, the Maples and the Lindens, then the Birches, the Pines, the Mountain Ashes and the Spruces of the extreme north. In these forests the Chestnut grows to its greatest size. The Wild Cherry produces trunks six feet in diameter, and the Tulip-trees send up stems still more massive. The White Oak, the Red Oak, the Black Oak, the Chestnut Oak and the Scarlet Oak attain here their greatest height and girth of stem; here the Snowdrop-tree, or Halesia, the shrubby ornament of our northern gardens, develops a great trunk free of branches for a hundred feet above the ground; here are the greatest Ash-trees on the continent, the noblest Hickories and the tallest and state-liest Hemlocks. In this wonderful region the Kalmia grows to the dimensions of a good-sized Apple-tree, the Tupelo is a forest-giant and the Rhododendrons are tree-like in size and habit. The Sweet Birch of the Smokies dwarfs the biggest Birch-trees of the north, and the Sugar Maples of New England are as pigmies in comparison with the Maple-

trees of the south. In early spring the floor of the forest is lighted up by the fiery heads of Azalea calendulacea, which decks for miles the upper mountain-slopes with solid masses of bloom, while Azalea arborescens dips its pure white fragrant flowers into every mountain-brook.

What has happened to the forests of the Doe River valley will happen to the forests of every other valley of the Appalachian Mountains, which sooner or later must give up their stores of timber to supply the wants of a nation which for more than a century has been wasting its fairest heritage. The best Walnut-trees and the best Cherry-trees in all the mountain-region have been bought up singly by speculators and converted into lumber. It is now almost impossible to find a large individual of either. Many of the remotest and most inaccessible valleys of the Smoky Mountains have already lost their best Tulip-trees, and as the demand for timber increases the wood-chopper will penetrate deeper and deeper into the recesses of these mountain-forests.

The destruction of all the large trees is now only a matter of comparatively a few years, and unless some measure can be adopted for the preservation of a block of this forest the inhabitants of America born fifty years from now will go to their graves without the opportunity of seeing the character of the trees their country produced when all conditions favored forest-growth.

The nation has decided to hold forever, for the instruction and enjoyment of the people, a portion of the Sequoia-forest in California; the civilized world has applauded this action. Not less important is the preservation, for all time, of a portion of the southern deciduous forest. This can only be accomplished by the nation, as any adequate forest-reservation in the southern Alleghanies would extend beyond the borders of a single state, and there is certainly nothing within the power of Congress to accomplish that would afford a more useful object-lesson or indicate a higher degree of civilization than the purchase and protection of a good example of this forest, that future generations of men may see and understand the capacity of American soil, and the beauty and majesty of its supreme products. It would not be difficult to select an area of moderate extent which should serve this purpose, and the first cost and subsequent care of such a reservation would not be large in proportion to the material benefits to be derived from it. Roan Mountain itself, on many accounts, would make the best reservation; the summit is exceptionally beautiful, and may be used by the public without injury to the forest; the peculiar position of the mountain makes the view from it more varied and extended than that from any other peak of eastern North America, while the railroad brings this mountain almost to the doors of a large population. These advantages, and the fact that the summit of the Roan is already occupied by a large and prosperous hotel, which is soon to be extended, would greatly add to the cost of the property, while the value of the mountain, as a forest-reservation, intended to illustrate the character and quality of the southern forest, is lessened by the removal of large trees of several varieties. A cheaper reservation, and one that would be more desirable, so far as relates to the actual condition of the forest, could be found in the Big Smoky Mountains, or in one of the cross-ranges which connect them with the Blue Ridge. Here a forest almost primeval and of unapproachable grandeur can be found, although a reservation made here would for many years at least be difficult of access, and would lack the extended view and open Rhododendron-crowned summit of the Roan.

The subject is one of importance to all Americans interested in the prosperity and future of the country, and Congress cannot do better than appoint a commission of experts to investigate the matter of a forest-reservation in the southern Alleghanies, and, if such a reservation is found practicable, to devise means for securing and maintaining it. If such a reservation can be made, and a few square miles of the Redwood-forests of the California coast can

be reserved, examples of the three most interesting forests in the world, the southern-Alleghany deciduous forest, the coniferous forest of the western slope of the Sierra Nevada, with its Sequoias and Sugar Pines, and the Redwood-forest of the Pacific coast, will be saved to interest and instruct future generations of men who will see in them the great marvels of vegetable growth which, without the intervention of the nation, are doomed to speedy destruction.

The Terrace at Haddon Hall.

WE print the accompanying illustration of the terrace at Haddon Hall (p. 329) as one of the most beautiful examples which could possibly be found of a combination of architectural and natural forms. The battlemented Elizabethan wing of the famous house is fine in itself, owing to good proportions and a noble simplicity of design; and the terrace with its broad flight of steps is well in keeping with it. But if we fancy them deprived of this foreground of level turf, this mantle of Ivy, and this background of luxuriant trees, we imagine a commonplace although good, instead of an extremely dignified, beautiful and individual effect. Nor, in the aspect of the verdurous environment, could we fancy any change which would be an improvement. The solid clipped hedge between the path and the walls gives the latter a base which brings them into harmony with the lawn. The Ivy grows in characteristically heavy masses but has not been allowed to infringe unduly upon the windows, and the contrast between the draped and the naked battlements is very picturesque. Then, just at the end of the house, the peculiarly heavy way in which the Ivy falls from the top of the wall admirably unites it with the trees beyond. These trees, rising back of the terrace, give it great dignity and make it seem a part of the main structure rather than an addition to it; and the Ivy does not clothe the terrace wall so thickly as to conceal its character. Of course in such a case it is impossible to say how much of the perfection of the result has been due to artistic gardening skill, and how much to the happy chances of nature. Yet one must suppose that, if constant attention were not paid to masses of foliage like these, they would soon overrun everything, and turn what is now an ideal combination of architectural and natural forms into a featureless mass of green.

Haddon Hall, one of the most famous of the great country-seats of England, stands eight miles from the town of Matlock, in a very beautiful region of country, on a bold eminence on the east side of the river Wye, and not many miles from Chatsworth, the equally famous but more modest seat of the Duke of Devonshire. Haddon Hall, soon after the Norman Conquest, was owned by the Avenell family, from whom it passed to the Vernons. Sir John Vernon, who was called the King of the Peak from his magnificent scale of living and lavish hospitality, and who died soon after the accession of Elizabeth, was the last male heir of this family, and Haddon Hall passed, by the marriage of his daughter, to the Manners family, who were then the Earls and are now the Dukes of Rutland. It remained their principal seat until the beginning of the last century, when it was superseded by Belvoir Castle in Leicestershire.

To this fact is probably due its preservation in its old-time estate. No part of it is of later date than the sixteenth century, while the chapel shows the style of the reign of Henry VI., and the tower above the gateway is supposed to have been built in that of Edward III. The gallery, which dates from the time of Elizabeth, seems to be the portion represented in our picture. At this time the great terraced gardens were also laid out. The park, once very fine, was plowed up and put under cultivation about ninety years ago, but some fine groups of trees were allowed to remain in the vicinity of the house.

WE are glad to observe the persistent efforts which are put forth by some enterprising manufacturers of bicycles

to have on exhibition at the Columbian Fair samples of well-made roads, in order that the people may become thoroughly acquainted with their value and the method of constructing them. Of course, good roads would be an especial boon to the makers of these machines, but they would be of advantage to every man, woman and child in the country, and we do not feel inclined to refrain from a grateful recognition of the work by Colonel Pope and his fellows, simply because they, along with all the rest of us, would reap some benefit from an exhibition of this sort. The famous journey from Chicago to New York by relays of wheelmen did a great deal toward enlightening public opinion as to the quality of our roads, since it was proved that over all the route between the two cities there was practically no road whatever in first-class condition. Good roads would, without a doubt, increase the sale of wheels, but on the other hand it is probable that the invention of the bicycle and its rapidly increasing use, both for business and pleasure, will do much toward hastening the improvement of our highways.

Indeed, it seems unfortunate that, instead of trying to secure a small specimen of good road at the Fair, the effort had not been begun earlier, so that a much more important and imposing exhibition of good roads might have been secured. The suggestion is, of course, made too late, but, if the co-operation of the various state governments could have been secured, it would not have been impossible to have had one perfect road from New York to Chicago ready for use during the Fair. It is a long journey from this city to Chicago, but we have no doubt that if there was a good road between the two cities there would be thousands of tourists who would make the entire journey by bicycle next year, and, of course, there would be thousands more who would start from intervening places. If too late for this, the wheelmen at least ought to begin at once to agitate for a road between New York and Philadelphia, or between New York and Boston, built in the most approved way, and kept in absolutely perfect order from end to end.

IN a personal letter recently received, Monsieur Naudin, writing from the Villa Thuret, in Antibes, says:

Speaking of Oaks, I am making an experiment which will perhaps be useful to the Algerians, the grafting of the Chestnut on *Quercus Mirbeckii*, a common tree in Algeria. The grafts have succeeded in a marvelous manner so far at least.

Prunus Davidiana, of which you speak in GARDEN AND FOREST, fruits freely at the Villa Thuret. Here it is a vigorous tree which is not attacked by the insects or fungi which destroy our Peach-trees. We are going to plant the seeds to obtain stock upon which you graft the common Peach in the hope that the grafted plants will be less liable to disease and insect attack. The fruit is as large as a walnut, with very thin flesh, and is not edible.

Among Vines I have an interesting novelty, the first fruiting in France of *Vitis rugosa* (or *V. Coignetiae*) of Japan, a dioecious species. For a long time we only had male plants, but from seed received three years ago from Japan we have raised female plants which have flowered, and the flowers, being fertilized by insects have produced handsome bunches of grapes much earlier than those of the common Vine, which is just coming into flower. Later we shall be able to judge if these Japanese grapes possess any economic value.

Fairmount Park, Philadelphia.

THE pleasantest way to approach this noble pleasure-ground is from the suburbs of Philadelphia, for, until the projected boulevard from the City Hall buildings is completed, the rattling of one's bones over the rough pavements from the heart of the city is very fatiguing. The entrance from Germantown gives one, however, a delightful drive through that historic suburb, with its quaint old houses lining its main street, and thence through the more modern highways, bordered by handsome houses set in spacious grounds. Should one choose the Wissahickon way, he makes a détour through the most picturesque region within the confines of the park, or should he desire a more direct approach, a series of cross-country

roads will enable him to reach, in less time, the more formal section of the grounds. There are many points about Fairmount Park which give it exceptional advantages as a place of resort, and the admixture of formality with rustic wildness gives food for all tastes. The Wissahickon drive has always been full of charm for those who love the shaded banks of a tumbling stream, winding through dense foliage and bordered by picturesque rocks hung with vines and ferns, and this, to the lover of seclusion and country charm, will always be the loveliest and most delightful portion of the park. But, on the other hand, the great bridges overarching the broad Schuylkill, the thronged driveways along its willow-planted banks, the group of buildings that survive the centennial exhibition with their surrounding of formal flower-beds, and, added to all, the view of the huge city with its towers and spires, will be ever full of attraction for the general public.

These two rivers, the Schuylkill and the Wissahickon, are the distinctive feature of this park; the one giving to it an imposing effect, and the other an exquisite rural charm. The great railroad bridge that spans the larger stream frames pleasing pictures in its arches. Along either bank wind wide, smooth driveways thronged with carriages and pedestrians, while countless gayly painted boats of varying shapes and sizes add to the cheerfulness of the scene. The shores of the river show wooded capes and pleasant bays of foliage; the throng smiles and chatters; groups of laughing young people rattle by on bicycles. Now and then a little cavalcade of riders dashes along, and the whole effect is joyous and gay.

I note the generally cheerful aspect of the frequenters of American parks, in contrast with the bored and uninterested look of people in London and Paris, who take their perfunctory airing leaning back languidly against the cushions and looking neither to the right nor to the left. Here, people enjoy the parks; they smile, they sit erect, there is an air of exhilaration and happiness about them refreshing to behold. There is a certain infectious gaiety in the scene, as if the world took its airing because it desired the fun, and not simply to be in the fashion. This is very apparent even among the serious Philadelphians, who relax the gravity of their aspect when they drive, and seem evidently to rejoice in the bright air and quick movement of the changing scene.

Two buildings of the exhibition of 1876 are still preserved in the park—Memorial Hall, which serves as a museum of pictures and relics, and Horticultural Hall, which affords shelter for tropical plants and for other delicate things which are used for the summer adornment of the grounds. Around these two edifices formal gardening is befitting, and here I found, in April, thick gay beds of Pansies and Tulips and Hyacinths that filled the air with fragrance. It was too early for much foliage, but there was a shimmer of green amid the ruddy tree-tops of the woods. Cherry and Peach-trees were blossoming bravely, and the Willows were in early leaf, casting golden reflections into the streams over which they hung. The charm of budding spring breathed gaiety and cheer, and the whole effect of the park, thronged with people, was inspiring. The Philadelphians take pride and delight in their park, as well they may, for such an open tract of ground (2,800 acres) near a great city is a wonderful possession, and the story of its gradual growth from its original small size is full of interest.

It dates back as far as 1812, when the Philadelphians, desiring to obtain a supply of fresh water free from the impurities of city drainage, purchased the precipitous bluff known from earliest days as "Faire Mount" over Schuylkill, which was then considered a remote spot. The first purchase was of five acres, but gradually other land was acquired, so that as early as 1828 the whole quantity was twenty-four acres, for which about \$117,000 had been paid. After the water-works had been established on a scale unexampled at that time for magnitude and excellence, the good taste and judgment of the projector suggested the planting of trees and vines to hide the rugged rocks. At that time all the surroundings were rural; beautiful country-seats were situated on either bank of the Schuylkill, and there were no factories or villages along the river for a stretch of fifteen miles.

For more than twenty years Philadelphia reposed in the belief of the unsurpassable excellence and perpetuity of the Fairmount water-works, but at the end of that time it was rudely awakened to a consciousness that the ancient country-seats were being deserted, and that manufactories and villages were clustering upon the river-banks, and endangering the purity of the water-supply. With characteristic public spirit the leading men urged prompt action, and, in spite of the usual opposition always encountered by the advancers of popular improvements, they were able to accomplish their purpose. An opportunity offered for buying Lemon Hill, an estate of forty-five

acres, belonging in Revolutionary times to Robert Morris, the patriot financier, and later to a successful merchant of liberal taste, whose embellishments had made it the pride of Philadelphia as Pratt's garden. It finally fell into other hands, and a commercial revolution enabled the city to purchase it for \$75,000 to protect the water-works. But not as yet was this ground considered a park for the people. For twenty years more there was a struggle between public spirit and officialism, and not until September 28, 1855, was an ordinance of councils approved which "devoted and dedicated to public use as a park the Lemon Hill estate, to be known by the name of Fairmount Park."

Another tract of land of forty-five acres was tendered to the city in 1854 by some generous citizens; but, as such benefactions are often treated, it was received with reluctance, and two years elapsed before the conditions of acceptance were fulfilled by laying out avenues and walks to enable it to be used as a pleasure-ground.

In 1857 thirty-four acres more were bought by subscription and tendered to the city, and again this gift was stoutly resisted by an opposition that did not shrink from denouncing not only the action, but the motive of the donors. But at last the large-minded men carried their point, and the Sedgeley tract, which also was once the property of Robert Morris, was added to Fairmount Park, and the munificence of the donors was gratefully recognized by the reluctant city.

A reference to the old documents in the Philadelphia library shows Holmes' map, dated A. D. 1687, to contain a manor of nearly two thousand acres called Springettsberry, which contains Faire Mount. This manor, sold by the commissioners of William Penn, and passing through various hands, has most of its disjointed fragments reunited as one body in the eastern area of Fairmount Park. Many of the contributions for the two tracts given by subscription were of a most generous nature, ranging from \$1,000 to \$10,000, but the greatest number of them were in sums of \$100.

From this point there was less obstruction, the park grew in popular favor, and a large tract of land was bought on the western bank of the Schuylkill by four patriotic citizens, and then offered to the city at the reasonable price at which it had been obtained. This time there was no hesitation, and the noble estate of Lansdowne, containing over one hundred and forty acres, was secured for something less than \$85,000, being a smaller price per acre than was paid for any other piece of land bought for this purpose up to that time. In 1867 an act was passed by the General Assembly of the Commonwealth of Pennsylvania, with the entire concurrence of the city of Philadelphia, giving a right, title and ownership to the ground appropriated for public purposes to the city, and providing that it should "ever be maintained as an open public place or park, for the health and enjoyment of the people of said city and the preservation of the water-supply of Philadelphia." The act further provided a Park Commission, composed of certain city officials and ten private citizens, to be appointed every five years by the District Court and the Court of Common Pleas, and to them the care and management of the grounds were entrusted, as well as the plans and necessary expenditures for their improvement and maintenance.

In 1868 the Park Commission prepared a bill for the Legislature concerning the boundaries of the park, and at that time the total area prescribed by the Assembly amounted to 2,240 acres, to which two more public-spirited citizens, Jesse and his sister Rebecca George, members of the Society of Friends, added as a benefaction eighty-three acres of valuable land which had been the uninterrupted home of their ancestors for many generations, only reserving an annual payment to Jesse George of four thousand dollars by the city during his life, and one thousand to his sister, whose share of the property was one-fifth. This part of the park, in memory of the generous givers, is known as George's Hill, by resolution of the commission, in handsome acknowledgment of this munificent grant.

After consultation with Messrs. Olmsted and Vaux, of New York, and Mr. Robert Morris Copeland, of Boston, a still further extension of the park was urged by the committee, both for the preservation of the water-supply and for the accommodation of the rapidly increasing population, and it was suggested that the romantic scenery of the Wissahickon would form an addition of untold value to the beauty and usefulness of the park.

This suggestion of the committee was accepted, and a chief engineer appointed to carry out the work. Drives and walks were constructed, springs were improved and ornamented, thousands of trees were planted, and permanent park boundary monuments placed in position, new acquisitions of land were made, and the work progressed steadily, till in 1878

the land belonging to the park amounted to 2,791 acres, a larger acreage than that of any park in this country. In 1876 the park was the site of the Centennial Exhibition, and to provide for the buildings and other accommodations for so great a number of people, many topographical changes were necessitated. The buildings were afterward removed, with the exception of those mentioned above, and the grounds, as far as might be, restored to their original condition, though some of the modifications of the surface were permanent; but it is claimed that these changes were rather to the advantage than the disadvantage of the park. Not long since the house occupied by William Penn, during his life-time, was removed, brick by brick, and rebuilt within the park, where it is an object of much interest to visitors.

One of the men most closely associated with the organization of the park was the venerable Eli K. Price, who continued in his office of Commissioner till after the age of eighty, furthering its interests always with assiduity and wisdom. As Chairman of the Committee of land purchases he had much to do with the acquisition of the valuable country-seats that were incorporated in its domain, and his sound judgment in matters of business enabled the commissioners to purchase while property was low, so that, vast as was the expenditure, it was still reasonable compared to the actual value of the land acquired. Over seven millions of dollars were expended in the mere acquirement of the property, which shows the admirable public spirit of Philadelphia, which is always to be depended upon in matters of real moment. In a report written by Mr. Price in 1878, at the age of eighty, occur the following pregnant sentences:

"The worth of life to us all is to live it and prolong it in health and enjoyment, and it is by thus doing that we best show our gratitude to the Giver of life. Conceive of our approximate million, and coming millions, as being without Fairmount Park, can any human imagination begin to estimate the sum of human health and happiness that would be lost to Philadelphia, Pennsylvania, the world? Who could make the trial to run the parallel of the value of ten million dollars as the price of the park invested, and running at interest for the city, with the successive generations of her millions of people without the culture, and health and happiness of the park, and not feel humiliation, and without being shocked at the meanness of the suggestion. Money is a sacred trust indeed for its potency for good, but life, health, happiness, and gratitude to God are worth more than all hoarded wealth. We have and will keep this park; we will improve and love it; it shall be our pride and perpetual enjoyment; it shall be for us 'a thing of beauty, and a joy forever.'"

A city in the breasts of whose citizens beats so patriotic a spirit as this may well be proud of them, and of the boon they have received at their hands, and well may they glory in the magnificence of this immense park, with its forests of venerable trees, its stately and charming rivers, its picturesque glens, its fine old homesteads, where but the great Oaks survive, its splendid and varied outlooks, its wild romantic resorts, and rolling hills clad in verdure. There is a wealth of vegetation upon this rich well-watered soil that makes cultivation not so much a struggle with nature, as a work of pleasure in directing it, and the long existence upon the spot of many venerable groups of trees gives a dignity and permanence to the aspect of this fertile park that is lacking in those of more modern construction. Indeed, the middle states, with their longer season, their greater depth of soil, can boast of finer trees than New England shows, except in its most favored sections, as in the Connecticut valley, for instance; and the whole effect of Fairmount Park was to me most lovely and impressive even before the summer had clothed it with its greatest weight of foliage.

One can well imagine the relief of its cool shades to the citizen baked in the brick oven of the level city throughout the torrid heats of a Philadelphia summer, and bless the foresight of those wise and generous men who provided for them this gentle and cool retreat, which must mean life itself to millions in the future.

Hingham, Mass.

M. C. Robbins.

Midsummer Shrubbery in North Carolina.

IN a neighbor's yard stands the largest plant of *Vitex Agnus-castus* (the Chaste-tree) I have ever seen. It is fully fifteen feet high and twenty feet across the top. Just now it is covered all over with its clusters of blue flowers. The books all call the flowers of this shrub "pale lilac," and so they are under glass, but out-of-doors there is only the faintest tinge of lilac to distinguish them from pure blue, and at a little distance

the effect of the mass of bloom is clean blue. It is strange that more use has not been made of this plant here, as the tree I have mentioned is the only one I have seen in Raleigh. A profuse flowering shrub with blue flowers is a rarity at any time, and particularly at midsummer.

In strong contrast with the Chaste-tree, the double-flowered Pomegranates have been making a gorgeous display for nearly a month. The brilliant scarlet flowers, as large as an ordinary rose, scattered over the glossy foliage of a tree twenty feet high, have a very pretty effect. There is in Raleigh one large and old Pomegranate of the double-flowering sort that annually produces flowers running all the way from pure white through flesh-color, pink, white and scarlet striped, to the most brilliant entire scarlet. I saw last week a superb bouquet cut from this tree, which illustrated its sportive character well.

White Oleanders, too, have begun their all-summer campaign of bloom. The single white sort seems to be the hardiest, and stands our winters in sheltered places quite well, while the pink-flowered sorts are invariably badly killed back if not carefully protected. If allowed to make a mass of shoots from the ground it is easy to protect any Oleander through the winter here.

But the popular shrub just now is the Gardenia, or Cape Jasmine. The ladies wear great clusters, cut with long stems and glossy leaves, and at the railroad-stations crowds of boys offer the summer traveler huge bouquets of the fragrant white flowers for ten cents.

Of the hardier shrubs *Spiræa Billardii* is now the most attractive, with its feathery spikes of flowers, looking well on account of its rarity here. The great evergreen *Magnolia*, of course, is in bloom, and has been for a month. One flower, with its big shiny leaves, makes a bouquet and perfumes a whole room.

I am planning a mass of shrubbery in which the white Oleander is to be the centre-piece, *Vitex Agnus-castus* is to surround it and kept slightly lower, then Cape Jasmînes, all around, and on the outside, as a guard and shelter, a row of *Spiræa Billardii*. Massed closely in this way, and with Pine-boughs stuck around in winter, to keep off the winter sun and wind, I have no doubt that all will do well.

The big Coral-plant (*Erythrina crista-galli*), of which I have written heretofore, came through the winter finely under a mound of sawdust, and now has a top six feet high and as many through, and is a perfect glory of crimson bloom, being, beyond all comparison, in advance of plants lifted and wintered under the greenhouse benches. From the hard woody character of the stump of this plant I believe that this mode of winter protection might be adopted at the north by making the mound of perfectly dry sawdust, and then covering it with a water-proof shelter like one of the corrugated paper hay caps now used. The experiment is well worth trying northward. Old plants of the Jerusalem Cherry (*Solanum Pseudo-capsicum*), I think, could be wintered there in the same way. Here I have an old plant of this *Solanum* that has stood for years past under the south side of a building, keeping its load of scarlet berries until Christmas, and never entirely losing its foliage, which only gets singed for a few inches at the top. The roots of *Manettia bicolor* came through, too, with a dry cover. There is much to be learned yet in regard to winter protection outdoors of half-hardy plants, particularly in mild latitudes, and I shall continue to work in this line.

Raleigh, N. C.

W. F. Massey.

Some Interesting Plants.

THE other day the youngest member of the family, who had been on a botanical expedition, brought in some flowers of a trailing vine which he had found growing in our marsh. It had rounded heart-shaped leaves, and small five-parted and wheel-shaped flowers of a dull purple. These soon proved themselves unpleasant neighbors, as they emitted a strong, disagreeable odor like that of rancid oil. The plant was new to me, but it was plainly a member of the Milkweed family, and a botanical friend identifies it as *Gonolobus hirsutus*. We examined with interest the short ovate flower-buds of these comparatively rare flowers, the fleshy ring in the throat of the corolla, and the waxy masses of pollen. There were ten of these fixed in pairs to the five stigmas. The plant is allied to the climbing *Periploca Græca*, sometimes called Virginia Silk-vine, which is occasionally seen in gardens, and is not a native of Virginia, but of southern Europe.

A few interesting shrubs are now beginning to bloom. One of these is an early *Hypericum*, *H. patulum*, which is the earliest of the family to bloom here. This has showy yellow flowers of good substance, about the size of those of the familiar Mock Orange or *Philadelphus coronarius*. The plant is an

ornamental one, with large leaves for a *Hypericum*, and pretty pink stems. Our specimen was planted in the spring of 1891. It died down to the ground last winter, but is now growing vigorously and has many flower-buds yet to expand.

Another pretty and rather uncommon shrub is *Callicarpa purpurea*, which is a large bush with ovate-oblong toothed leaves, and clusters of small, light pink flowers, now in bloom. A striking peculiarity of this shrub is the fine yellowish dust with which the purple stems are sprinkled. The grains rub off at a finger-touch. They are ornamental, and, perhaps, some wise botanist has discovered their meaning and use, and how they are produced so freely. The foliage of this *Callicarpa* is a pretty shade of light green, contrasting well with the purple or plum-color of the stems and with the beginning of the midrib of the leaves, which is of the same rich color. The shrub is valuable in fall and winter for the metallic blue of its small polished berries, which remain upon the twigs until spring.

Another very pretty little plant, which is behaving quite as a well-bred plant ought to do, is *Abelia rupestris*. This is now showing a few very attractive trumpet-shaped white blossoms with small pink sepals at the base of the corolla. The flowers are delightfully fragrant. It has many buds, and will remain long in bloom. It is an evergreen here, with small varnished

Sander & Co. under the name of *T. Brymeriana*. It has white sepals and petals flushed with mauve, and a labellum like that of *T. Marshalliana*, with the addition of a dash of purple on the middle lobe. The two parents of this hybrid have lately been an attraction at Kew. No tropical Orchids are less difficult to cultivate, and not many surpass these *Thunias* in attractiveness when in flower, the dazzling snow-whiteness of the one and deep amethyst-purple of the other, the large size and abundance of the flowers on well-managed specimens, together with their lasting qualities, being all desirable characters in garden Orchids.

CATTLEYA PRINCEPS.—I should call this nothing more than *C. granulosa*, var. *Schofieldiana*, although its possessors, Messrs. Sander & Co., consider it distinct enough to merit a name. It has tawny yellow sepals and petals, blotched with purplish crimson, white side lobes to the labellum, and the midlobe covered with maroon papillose spots. The flowers are very large, and to some tastes very ugly.

CATTLEYA AMESLÆ.—This is a beautiful albino, much like *C. Warneri* in the size and form of its flowers, which are

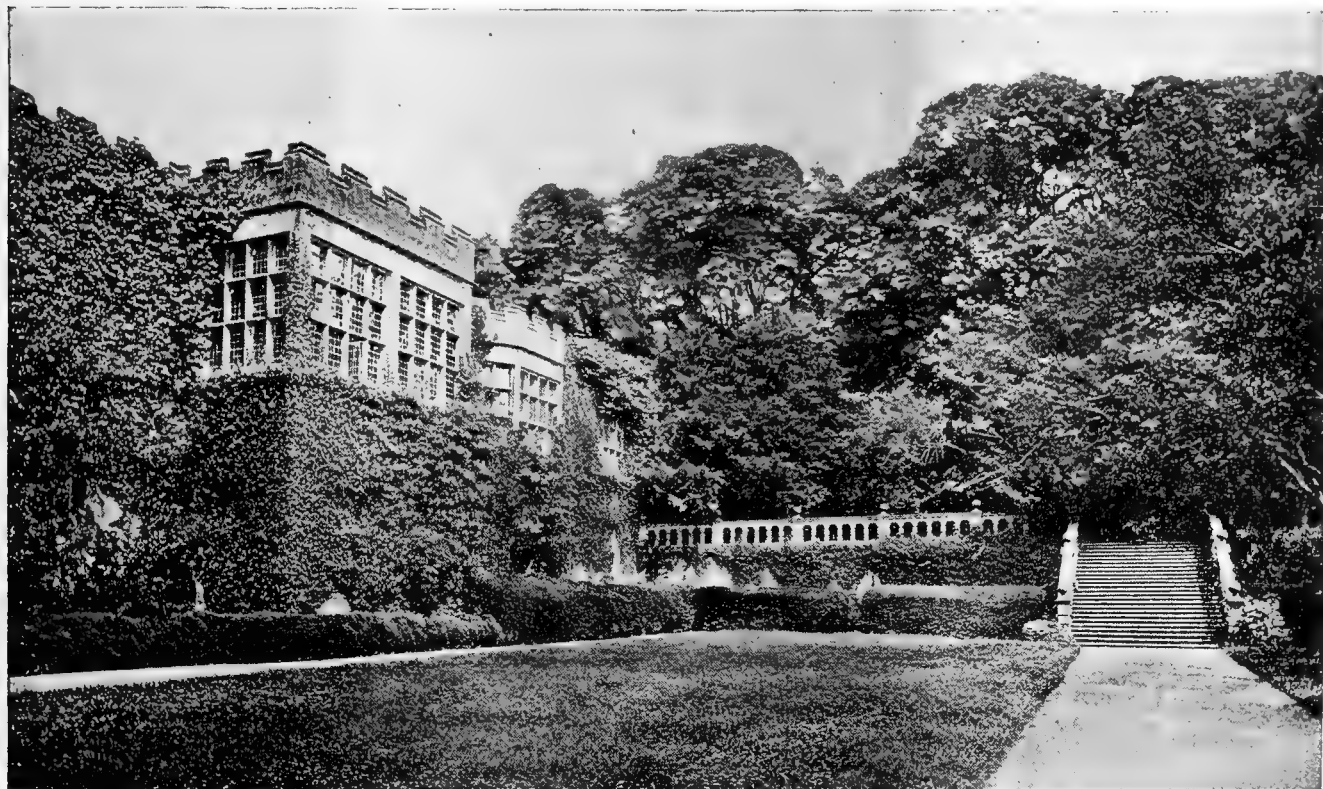


Fig. 58.—The Terrace at Haddon Hall, Derbyshire, England.—See page 326.

leaves and pink stems. Its hardiness has not yet been fully tested here, but it has proved equal to the winters of Washington, where it has been for years, I am told, a conspicuous ornament of the public grounds. It has grown rapidly here since it was planted, and is in partial shade. It forms a neat small shrub pretty at all seasons.

Hollyhocks, Yuccas and Trumpet Creepers, on this second day of July, are still flowering very lavishly, and many late *Spiræas*, herbaceous perennials and annuals furnish us with an abundance of cut flowers. As yet we have had a favorable season, with no very dry weather, and the grass is still fresh and green.

Rose Brake, W. Va.

Danske Dandridge.

Foreign Correspondence.

London Letter.

THUNIA VEITCHIANA ×.—This plant was raised in the Chelsea Nurseries from *T. Marshalliana* and *T. Bensoniæ*, and flowered in 1885, when it was named by Professor Reichenbach. The same cross was shown at the Royal Horticultural Society meeting last Tuesday by Messrs. F.

pure white, with a tinge of yellow in the throat. It was exhibited by Messrs. F. Sander & Co. at the last meeting of the Royal Horticultural Society, and obtained an award of merit.

SOBRALIA LUCASIANA, a variety of *S. macrantha*, with short stems, very broad leaves and flowers with white segments, the lip pale rose, with a yellow blotch in the throat, was awarded a first-class certificate, as also was *Cattleya Empress Frederic*, from Baron Schroeder's collection. This is a Veitchian hybrid raised from *C. Mossiæ* and *C. Dowiana*, and is characterized by white sepals and petals, a deep maroon-purple lip margined with a much paler shade, the whole flower being of exceptional size and beauty. *Dendrobium Souvenir d'Alec* is a white-flowered variety of *D. transparens*, and *Grammatophyllum Seegerianum* is what we have had already under several different garden names, but is probably *G. Fenzlianum*.

LÆLIA GRANDIS, var. *TENEBROSA*.—This magnificent variety of a comparatively mediocre species has recently figured largely at exhibitions in England. It is one of the most

attractive of all Cattleyoid Orchids, its huge flowers of a rich red-brown and maroon having few equals. Recent importations of this plant into England have made it comparatively plentiful in English collections, although it is still an expensive Orchid.

CALLA ELLIOTTIANA.—The whole of the plants of this new yellow-flowered Calla, or, as it should properly be called, *Richardia*, was sold by auction a week ago. It will be remembered that the plant was first brought into notice at one of the fortnightly meetings of the Royal Horticultural Society about three years ago, when it was awarded a first-class certificate. Since then Captain Elliott had increased the stock, by means of seeds and offsets, with such success that he was able to put up nearly two hundred and fifty plants for sale. These realized from seventeen guineas to about twenty-five shillings each, according to size, the total sum obtained for the whole being four hundred and sixteen pounds. The London nurserymen were the principal buyers. No doubt, in a few years this beautiful plant will be as plentiful in gardens as the white-flowered one is now. Evidently it is as easy to manage as the rest of the *Richardias*. I omitted to state in my previous letter that Captain Elliott's Calla was awarded the first prize for the best new plant in bloom at the International Horticultural Exhibition at Earl's Court.

CALLA PENTLANDII.—A plant bearing this name was exhibited at a meeting of the Royal Horticultural Society, held on Tuesday last, and from its being yellow flowered it attracted much attention. While it differs from *C. Elliottiana* in having a slightly larger spathe, and in being tinged with purple at the base inside the spathe, as well as in having unmottled leaves, it still bears a good general resemblance to that plant, and is probably another form of the same species, whatever that may be. The species of *Richardia*, at present known in gardens, are *R. Æthiopica* (*Africana*), *R. albo-maculata*, *R. hastata* and *R. melanoleuca*, and no doubt these two new yellow-flowered kinds are varieties of one or the other of these.

TREE-PRUNING was the subject of a lecture by the Director of Kew, Mr. Thiselton Dyer, at the last meeting of the Royal Horticultural Society. It is a fact that only very few people pay any attention to the proper manipulation of young trees intended to form ornamental specimens in parks and gardens. As a rule, a tree is allowed to grow as it likes after it is once planted, and as a consequence a large proportion of the trees one sees in gardens are unshapely, and sometimes even a source of danger. Tree-growers who understand their business are alive to the necessity of careful pruning from the nursery to the full development of the tree. Mr. Anthony Waterer declares that if properly managed all trees should be able to support themselves from the beginning, and to enable them to do this they must be prevented from making strong lateral growth until the trunk, or back-bone, of the tree has been formed. Mr. Dyer pointed out that, with few exceptions, height is the first desideratum in a tree, and to enable it to attain this the growth must be encouraged in the leader and kept within bounds in the lateral branches. In shallow soils most trees have a tendency to become mop-headed. Like root, like top, is the rule that controls tree growth. In deep soils there is less need of pruning, but in all soils it is necessary to watch the development of the trees, and prevent such growth as would throw the specimen out of balance. Of course, the cultivation of trees for timber is one thing, whereas that of trees intended for ornamentation is another. But all trees require to be looked after and kept shapely from the first. The way to prune and the way not to prune were pointed out by Mr. Dyer, and the value of coal-tar and carbolic acid as a dressing for tree-wounds was testified to by the good results obtained by its use at Kew.

ROSE CRIMSON RAMBLER.—This is a rich crimson-flowered bunch Rose of very great promise, of which Messrs. C. Turner & Sons, Slough, hold a large stock. It was obtained by them, indirectly, from Japan, and was certificated

two years ago by the Royal Horticultural Society, under the name of "Engineer." Mr. Turner says it is one of the freest Roses he knows, and the long, sturdy branches, large, healthy foliage with huge bouquets of compact blood-red flowers on the specimens he exhibited last Tuesday, bore out this statement. The plant is one of the many forms of *R. multiflora*, and is probably the very best of these as represented in English gardens. The general verdict with regard to it at the Royal Horticultural Society's meeting last Tuesday was that it was a Rose of quite exceptional merit.

The exhibition of Roses held last Tuesday was remarkable for the number of beautiful cut flowers of Tea Roses, and also for the collection of Sweet Brier hybrids exhibited by Lord Penzance, to whose sagacity and skill we are indebted for these beautiful Roses. By crossing the common Sweet Brier with various kinds of garden Rose, Lord Penzance has obtained an entirely new break, for while the flowers still retain the charm of form of the Sweet Brier-blooms, they have gained in substance and in variety of colors from the other parents. Thus there are many shades from pale blush to deep crimson, and a few of the kinds are semi-double. The leaves are almost as fragrant as those of the Sweet Brier.

HERBACEOUS PÆONIES have lately received special attention in England. Chiswick has now a large collection of named varieties obtained from all the best growers, and a committee of experts met there recently to judge them. Great improvements, both in form and color of the flowers, have been made by recent breeders of these plants, and they are consequently becoming generally popular. Herbaceous Pæonies have all the good qualities of first-rate border-plants, and scarcely any bad ones. Planted in good, deep soil, and let alone, they will form strong clumps in a year or two, and when in flower they make a grand display. One of the lawns at Kew has this year been given up entirely to large beds of Pæonies, and although the plants are too small to make much display, yet they already show promise of developing into a most effective garden. The named varieties are endless. In planting, it is advisable to pay some attention to the grouping of the colors, or harsh combinations will probably occur. The best of those which received the premier award this year at Chiswick were as follows: White—Queen Victoria, Duchesse de Nemours, Grandiflora nivea plena, Neomie Demay, Virginie, Madame Montigo, Albiflora Whiteleyi. Pink—La Voluptuese, Modeste, Camille Lemoine, Madame Ducel, Eglais Adanson, Lutitiana, Madame Jules Calot, Comte de Nanteuil, Lilacina grandiflora, Furtado, Miranda, Charles Binder. Crimson—Edouard André, Rubra triumphans, Paul de Ritert, Madame Mechin. Yellow—Canari, Sulphurea, Prolifera tricolor, Flavescens.

London.

W. Watson.

Cultural Department.

Notes on Shrubs.

WITH the beginning of July there is a very marked decrease in the number of our shrubs in flower, and every one which comes into blossom after that time possesses more than ordinary value, because the great majority of trees and shrubs have ceased flowering by the end of June.

One of the most conspicuous shrubs in blossom in the last days of June and early in July, in this vicinity, is the tall *Deutzia scabra* in its several forms. Although an introduction from eastern Asia, this species is an old inhabitant of our gardens, and, like the earlier-flowering dwarf *D. gracilis*, it has not been much modified or very greatly improved since it was brought to European and American gardens. There are, however, a number of named forms in cultivation, none of which can be called remarkable as distinct or as improvements over the standard single and double flowering kinds. This *Deutzia* has been received at the Arboretum under a number of specific names, such as *D. Sieboldiana*, *D. Japonica* and *D. crenata*, with their varietal designations appended, but all are unmistakably *D. scabra*. The single-flowered plants, which are very easily raised from seed, often show a considerable difference

in the size of the blossoms, the petals in some seedlings being much larger, and therefore more showy, than others. There are forms in which the buds, and, after expansion, the outside of the petals, are of a deep pink color. A plant received from England as *D. scabra candidissima* cannot be called any finer or whiter than the ordinary forms. The *D. candidissima* flore pleno of some American nurseries is simply a double white-flowering *D. scabra*. A well-known American firm has sent out a fine double form under the name of "Pride of Rochester," which has longer petals than some others, and has pinkish buds. There are, however, only twenty petals to each flower, so that the centre is somewhat open and plainly shows the pistils. In other variations the petals are more numerous, thirty being a common number, and as they are more crowded the blossom spreads out wider and has more of a compact rosette character. A good form, with these full double flowers, has been sold as *D. Watsoni*. As is the case with so many other cultivated plants, there is a monstrous form of this *Deutzia* which has variegated foliage, the leaves being blotched or mottled green and white. While it is odd, it cannot be called pretty, and, like most other variegated plants, it should not be planted except as a curiosity. These variegated leaves are often more or less misshapen, and are liable to revert to the green form, their normal healthful condition. Any peculiarly striking form of this *Deutzia* may be propagated by layering, or on a larger scale by cuttings of ripe or green wood. As they usually bear fruit in abundance, the amateur may raise any number of plants from seed and retain such as produce the best bloom.

Both the early and late flowering *Wistarias* have generally quite passed their flowering stage, although the early-flowering Chinese *Wistaria* bears a few stray and poor racemes of flowers on its new growths. Our American species, the late-flowering *W. frutescens*, is ordinarily quite out of blossom by this time (July 2d), but there is in the Arboretum collection a variety or form of it which is still quite showy. This was received several years ago from the Messrs. Parsons under the name of *W. frutescens magnifica*, and it differs from the common type in having racemes which are sometimes over a foot in length, whereas in the common well-known form the racemes are usually very short and the flowers clustered. The flowers of this *Magnifica* form are large, of a pale purple or lavender color, and at this time the apical ends of the racemes, for about half their length, are still covered with flowers and flower-buds. It is not generally known that there is a white-flowered form of *W. frutescens*, which, like those of the type, has its blossoms in short compact clusters.

Visitors traveling to the sea-shore resorts north of Boston are at this season charmed and delighted with the bright yellow covered hills in the vicinity of Salem and in other parts of Essex County. The blossom which makes this handsome show is that of the Woad Waxen, or Dyer's Broom (*Genista tinctoria*), which now covers hundreds of acres in this part of Massachusetts, and has become established, in a small way, in other localities and places. Once established, it is likely to become a troublesome weed, and wherever it is introduced as an ornamental plant it should be looked after, that it does not get too commonly wild. Here it appropriates the surface of the soil to the exclusion of almost every other kind of vegetation, and seems thoroughly at home. The foliage, when in good condition, covers the ground with a glossy deep green, the stems being from one to two feet high, and when in blossom the whole surface of the ground, when viewed at a little distance, appears covered by a bright yellow carpet.

It is believed by many that the Woad Waxen was first introduced from Europe by Governor John Endicott, who brought it to his garden, at Salem, Massachusetts, in the first half of the seventeenth century. It was probably brought over for the beauty of its yellow blossom, although sentiment may have been the chief motive; or, what is not at all improbable, it may have been introduced and purposely allowed to become wild, with the idea that it might be of use to the colonists for the yellow colors to be obtained from its stems and branches, for which purpose it was extensively used in the mother country.

The Woad Waxen in the Arboretum is liable to suffer from two or three diseases, which injure it very much at or after blossoming time. A species of *Aphis* is sometimes very abundant on the young shoots, dwarfing the growth, and, by the excretions of the insects, causing the plants to have a grayish appearance at blossoming time. About this season the leaves also often turn dark brown or black and fall, apparently from the effects of some attack by fungus. A large ashy gray-colored, so-called Blister-beetle (*Macrobasis unicolor*) is also extremely fond of the leaves, and often occurs in such numbers as to

quite strip the plants of foliage before midsummer. These beetles also greedily devour foliage of the Honey Locust and other plants of the Pea family.

Arnold Arboretum.

J. G. Jack.

Garden Carnations.

THE Carnation in its many varieties, not the florist's type, divided up into several sections according to the disposition of color on the petals, but the robust, free-blooming self-varieties, by force of decided and distinct colors, creates a rich effect in the garden. During the past few years much interest has been taken in the Carnation in England, not regarded from the strict florist's point of view, but simply as a garden-flower—free, robust and showy. The florist's kinds, the Bizarre, Flaked and Rose sections, fail through their want of decided effect. The kind of coloring is not distinct, and a bed of the most expensive varieties is not so beautiful to look upon as a mass of such a fine flower as the rich self-Kelton Rose or the lovely Comtesse de Paris, with a flesh-tone as delicate and refined as the most ardent lover of soft shades could desire.

There was need of much improvement in existing kinds of Carnation, self-colored it is true and often very beautiful, but the flowers lacked one essential quality in a typical garden variety—that is, a sound calyx, a calyx that keeps intact even during a period of wet weather. Those that burst the calyx are practically valueless, the petals tumbling about in hopeless confusion, unkempt and unsatisfactory. This is an important point, not only for the value of the flowers for the garden but also for cutting. A variety that carries its bloom in free clusters, with an entire calyx, and sends up a succession from the younger growths is of great value, both for supplying bloom for the house and for enriching the bed or border. There are certain indispensable qualities in a garden Carnation: (1) the flowers should be of a solid color, decided, rich and telling; (2) the calyx must not split; (3) the plant must have a robust habit, the growth vigorous, and (4) it must have fragrance. The first two points I have already made allusion to, and it is scarcely necessary to urge the impossibility of getting satisfactory plants if the varieties selected are of weakly growth. Few plants are more miserable in aspect than a sickly Carnation, and unless provided with an abundance of sturdy, healthy foliage it is useless to expect good effect or obtain shoots for layering. It seems strange that, notwithstanding the precious gift of fragrance to the Carnation, the delicious perfume of the old crimson Clove, or of its white counterpart, that this delightful attribute has been often overlooked. Varieties practically scentless are praised, but they lose much in value when deprived of one of the greatest charms of a Carnation. Scentless Roses abound, and yet are retained in cultivation through exceptional form or color.

The smooth-edged flowers make the finest color-effect; but quite as attractive, in their way, are the fringed varieties, the uneven edged imparting a certain charm. One of the most delightful garden varieties I can call to mind is Raby Castle. The flowers are not remarkable for breadth of petal or what may be called robust expression, but the color, a kind of bright pink with a trace of salmon in it, is very effective in a mass. The fragrance is moderately strong, and the petals fringed. It blooms with the greatest profusion, produces an abundance of foliage, and may be made use of for forming broad edgings to walks, or, at least, borders, with the full assurance that it will please. This is the kind of Carnation that should be encouraged. A large, finely developed flower, broad in the petal, full, and robust, is a first consideration.

A lovely Carnation is Comtesse de Paris, which we have many times seen in fullest perfection. It is one of the most delicate in color, a tender blush, the flowers of exceptional form and delightful shape, and carried freely on sturdy stems, the foliage of great vigor. The calyx does not split, and there is another great feature, the plant sends up a succession of spikes, thus continuing the season long past that of the ordinary kinds. This is a point of great importance. We have here a forerunner of a race that will last in bloom until the season of frosts.

The great desideratum is to raise seedlings possessing the merits alluded to, and some varieties come very true from seed. A very striking new variety is called the Queen, sent out only last year by Mr. Charles Turner, of Slough, and raised from continental seed. The color is rich, clear and decided rose; the foliage very strong; habit dwarf, robust, and not drooping, and the calyx very firm.

A successful English grower of the Carnation recommends, as a top-dressing, soot and wood-ashes, as wireworms, a great pest, dislike them. Use manure sparingly, as some of the

most splendid displays I have seen have been in light, sandy soil, almost sea-shore sand, in full exposure to the ocean, the plants appearing to relish the salt spray.

Kew.

V. C.

Hardy Herbaceous Plants.

THE theory that the colors of the flowers of certain genera were limited received a severe blow when the scarlet Larkspur (*Delphinium nudicaule*) was discovered in California some years ago; and still later when the yellow *D. Zalil*, from central Asia, produced quite a sensation. The latter species, however, is only an annual, or biennial at best, and is likely to be superseded by the newer *D. Przewalksyannum*, which is a true perennial, and perfectly hardy, having stood the winter here unprotected. The leaves are orbicular-peltate, handsome. The spike is branched, about five feet high. The flowers are small, but abundant, sulphur-yellow, with short, scarcely spreading sepals lined with black hairs, and anthers black. The spur is long, straight and abruptly pointed. This species comes from central Asia, a region which, as yet, has been very little explored. For nearly all recent introductions we are indebted to the late Dr. Regel, to whose kindness and generosity a large army of correspondents can testify.

Cimicifuga racemosa is a strikingly bold and handsome border-plant, a native of the United States. It would make an elegant lawn specimen, fit to rank with *Eulalias* and other tall grasses for this purpose. The leaves are broadly triternate, with serrated margins like those of *Astilbe Japonica*, but with a spread of a foot or more. The compound spike is clothed for eighteen inches of its length with small, white, saucer-shaped flowers, which last a long time in good condition. The flower-stalks stand fully three feet clear of the foliage, stiff, erect, and without the least need of a stake. When out of bloom it is never unsightly. It may be raised from seed, which, however, needs more than a year to germinate, or by division, but it is very slow to establish itself. The specimens to which I have reference have required three years to attain the perfection of the original plant before it was divided.

Of the many border Catchfly-plants the scarlet *Lychnis Chalcidonica* excels them all for general usefulness. The brightness of its flowers attracts the eye from a considerable distance. It is very hardy, and is more or less in bloom from June until frost. The flower-heads resemble those of the common Sweet William, and the plant is just as easily raised from seed, and will bloom the first season if sown early. There is a double variety, also in bloom, but it is not nearly so robust as the single form.

Bocconia cordata is a well-known border plant, although somewhat despised, on account of the rapidity with which it spreads, crowding out almost everything but the coarser Sunflowers; and, from the fact that when once established it is hard to get rid of. When properly used it is an effective plant, and here we find it very serviceable with tall Sunflowers, *Silphiums* and New England Asters, as a screen for a by-path leading to the house. It is a native of China, and belongs to the Poppy family. The leaves are heart-shaped, with deep round clefts, glaucous green on the upper surface, and almost white beneath, which makes a very pretty effect when there is breeze enough to turn them over. Small white flowers terminate the stems, arrayed in a plume-like panicle. It is easily propagated by cuttings from the axils of the leaves or by division of the roots.

Campanula latifolia, var. *macrantha*, as it now appears with large pendent bells of blue, reminds me of the large plants of this species at the old Botanic Gardens, at Hull, England. Not all *Campanulas* are vigorous enough to endure our winters well. Many live through, but scarcely recover sufficiently to make any progress during the succeeding summer. At Hull there were large old specimens seven feet high, the clumps at the base measuring two or more feet across. *C. Van Houttei*, a very handsome garden hybrid, lives along and blooms sparingly, but never does justice to its reputation. In *C. Pallasii*, now in bloom for the first time here, we have a plant of promise, since every specimen came up after the winter with increased vigor. The leaves are ovate-cordate, with sinuated margins. The plants grow from two to three feet high, and make nice bushy, self-supporting specimens. The flowers are about two inches long by nearly one inch in diameter, violet-purple and pendulous; it is easily raised from seed. The variety *Speciosa* of *C. glomerata* is a most satisfactory plant, being thoroughly hardy. It grows about two feet high, bearing terminal and axillary heads of bright blue flowers, and lasts in bloom from June to September.

Astragalus Monspessulanus has been in bloom for a month, and is the most ornamental of all the alpine Milk Vetches in

cultivation. The stem is very short, with prostrate branches. It seldom grows more than nine inches high, and is covered from spring until autumn with handsome, hairy pinnate leaves. The flowers appear in dense prostrate racemes, reddish purple, changing to violet, and continue two or three months in bloom. It is a native of south Europe, and is best raised from seed.

The hoary-leaved *Veronica incana* makes an excellent rock-plant, and is attractive in or out of bloom. It is often effectively used in border-lines for the front rank. Flowers blue, in short spikes.

Geranium sanguineum cannot be too much recommended to all those who love a plant which "blooms all the time." From June until September this is bright with its salver-shaped, rosy violet flowers, and combined with abundant neatly orbicular-peltate leaves, it never looks untidy.

That giant among the Heron-bills, *Erodium Manescavi*, succeeds well here, and is another of those plants which are more or less in bloom the whole summer long. The stems are short or prostrate. The flowers are rose with deeper shades, and are produced rather stragglingly, but its handsome, hairy, fern-like leaves, often a foot in length, alone would commend it. *E. macradenum* is a more modest little species, having short stems clothed with elegantly divided foliage. The flowers are white with purple veins, and not unlike those of a small fancy *Pelargonium*. It is a native of the Pyrenees, and may be increased either by seeds or cuttings.

Helianthemum vulgare, the true Rock Rose, with several other species, mostly European, has given us some beautiful hybrids, ranging in color from white through all shades of red and yellow. They are low shrubs, and are more or less in bloom the whole season.

Oenothera Missouriensis bears surprisingly large flowers for a plant so modest in appearance, compared with many other members of this genus. Neither are its flowers so partial to shade as those of many of its relations commonly known as Evening Primroses, since their flowers open only in the evening. It is altogether a desirable plant, and is most effectively placed where its trailing stems can hang over some rocks.

A few seeds of a much improved form of *Dianthus armulatus* were sent me last year. Although this is one of the parents of the beautiful border Pinks, the type in a wild state gives surprisingly small flowers. These improved varieties, now in bloom, are, however, large and handsome, mostly of soft pink shades, but all have the darker ring formed by a blotch at the base of each petal-lob.

Wellesley, Mass.

T. D. H.

The Water Garden.

NYMPHÆA *Marliacea albida* is a hybrid Water-lily now bearing flowers which seem to be of the first-class in size and beauty. The petals are narrow and more numerous than those of *N. alba candidissima*, and they are of a translucent silvery white instead of opaque, as in that variety. The flowers are fragrant and freely produced, and altogether very distinct.

N. Marliacea carnea is the lightest colored of pink Pond Lilies. The flesh tint is of the clearest and most delicate shade. Nothing could be more exquisite than a half-opened cup-shaped flower in which the charming color is concentrated and relieved by the golden petals. The form is that of *N. alba*. When the flower is fully open the shade is of the faintest.

N. odorata Carolinensis is a very large full flower of the *N. odorata* type, with a suffusion of pink. My flowers of this plant have as yet failed to give the full coloring of those grown by Dr. H. T. Bahnson, with whom it originated, and, I presume, some difference of soil in which it is planted may be the cause of this.

N. gigantea is an Australian species now in flower. This is a tropical Nymphæa, and not to be confused with *N. odorata gigantea*, under which name a large-flowering form of our native Pond Lily is being offered. *N. gigantea* is probably one of the handsomest of Nymphæas, the color being a satiny-blue shading to white, with yellow silk-like stamens. The flower is carried above the water on a stiff stalk, and is about the size of those of *N. Zanzibarensis*. The leaves are dentate, green above, and bright purple beneath. From its Antipodean origin this plant would naturally flower in the winter, and it seems a difficult one to start, as it needs warmth. It is said to be impatient of root-disturbance. My tubers started up several times, and for no visible reason as often dropped their leaves. It may be well to say that for the opportunity of flowering this I am indebted to a friend, several hundred miles away, who sent me a strong plant already established. I mention this to

show (the plants now growing strongly) that *Nymphæas* may be safely transported, when moving, without injury.

Nymphæa candida is a white-flowering species from Bohemia. This seems of second size, but very free-flowering. The flowers are rather incurved at the tips of petals, which are of medium width. The color might be compared in purity and tone to that of the Snowdrop.

N. odorata sulphurea, somehow, has failed to secure the vogue of *N. chromatella*, but it has a charming flower of a sulphur tint, with light golden stamens, distinct, and well worth adding to the best collections. It has slightly narrower petals of less substance than *N. chromatella*. The leaves are maculated brown above, and thickly spotted with blood-red under.

The prevailing cool nights and frequent rains have not furnished the very best conditions for the growth of the tropical *Nymphæas* this season. The same conditions affect the hardy ones, though more slightly. These latter seem, however, to require more care in planting than the tender ones, which seldom fail to grow away strongly, while if the rhizomes of the hardy kinds are too deeply covered, or are not satisfied with their compost, they are apt to make very little progress. They also seem to resent shading and drip from other plants. The *Nelumbiums* seem especially particular in their requirements as to proper planting. If they are under proper conditions, few plants make more rapid and satisfactory growth, yet slightly different ones will cause them to halt. Of my two clumps of these, both planted on the same day in the same apparent mixture of soil, one has numerous large leaves and several buds, while the other is only now putting out a few small floating leaves. They are in different tanks, but have the same exposure, except that the slow ones are slightly shaded and receive a drip from an *Eulalia*. As in other garden-plants, apparently very slight conditions make the difference between success and failure.

Elizabeth, N. J.

J. N. Gerard.

Armeria vulgaris.—A delightful margin to walks, beds and borders is one formed of the common Thrift. It is a very hardy plant, the growth even, of a refreshing green color, and preserving its charming character the whole season, but, in addition, during the month of June there is a wealth of flowers that make an even surface of rich rose, distinct, decided, and beautiful. The effect of the Thrift thus used is to alter for the good the whole complexion of the garden. Its hard lines are toned down, and in the month that we long for flowers they are supplied in plenty. Edgings formed of this sea-shore *Armeria* last in full beauty about four years, but after that period it is wise to lift the plants, divide, and make a fresh planting. At first, the plants, which should be put in tufts a few inches apart, have not a very agreeable appearance, but they soon fill their allotted space, and then we have a soft cushion of growth, pleasant to the eye. Soft stone, with various pretty creeping plants allowed to run over them, is excellent for an edging, and for the sake of variety one may use the dwarf *Phloxes* and such things as the *Gentianella*, very beautiful where it can be induced to grow and flower with freedom.

England.

V. C.

Correspondence.

Roan Mountain—A Summer Resort.

To the Editor of GARDEN AND FOREST:

Sir,—To some of your readers Roan Mountain is perhaps still unknown, although the summit, which is within thirty hours' ride of New York, is one of the most beautiful spots in America, and offers opportunities to lovers of nature which no other place of easy access to the people of our northern cities equals. Roan Mountain, which is one of the highest of the Appalachian peaks, is situated eighty miles north-west of Asheville, in North Carolina, the boundary between that state and Tennessee crossing its summit. It can be reached from this city by an agreeable and easy journey. The quickest and most picturesque route is by Philadelphia, Harrisburg and the Cumberland and Shenandoah valleys; in Pennsylvania and Maryland the traveler passes through one of the best-tilled and richest farming regions of the continent; just before the Potomac River is crossed, he passes over the battle-field of Antietam; in Virginia he can break his journey at Louray and explore the caves which have made this place famous. The accommodations here are excellent. A second stop can be made a few hours further south at the Natural Bridge, one of the marvels of America, and unsurpassed as a single object, independent of other features of striking beauty. Passing from the valley of the Shenandoah, the route enters that of

the upper James, a region of fertile fields, low, well-wooded mountains and picturesque scenery. The cars are changed at Johnson City, in east Tennessee, once notorious for the badness of its hotel, but now a booming town with an electric railway, brick blocks, a magnificent new hotel, and all the push and go of the "new south."

Here, the traveler leaving the East Tennessee, Virginia and Georgia Railroad embarks on a narrow-gauge road built to bring the iron ore from the famous Cranberry mines situated at the foot of the Roan. Its way for twenty miles is up the broad valley of the Watauga River, a tributary of the Holston, which flows out from the western slopes of the Blue Ridge; then it swings to the south and traverses Happy Valley, whose fertile soil a hundred unmanured crops of corn have not exhausted. This is the first valley in Tennessee settled by whites; here is still to be seen the remains of the first block-house built to afford defense against the Indians; here is still standing the tree under which the first court was held in Tennessee, and not very far away are the ruins of the first iron furnace established west of the Alleghenies. Gradually the valley narrows and the road-bed is carried along the borders of Doe River, a tumultuous mountain stream, which heads high up on the flanks of the Roan. In picturesqueness this part of the journey is not surpassed by that of any other rail route in the country; at one place, the stream tumbles through a narrow gorge at the foot of precipices hundreds of feet high; at others, its rocky banks are clothed with tall Hemlocks, shading vast thickets of the great Bay (*Rhododendron maximum*), which grows here with a luxuriance and splendor which astonishes the traveler unfamiliar with the Appalachian forests. Here twenty years ago he could have seen these forests in all their magnificence and Nature's supreme effort in forest-production, for in the number of species of which they are composed, and in the size and beauty of individual trees, these southern forests surpass every other deciduous forest of the earth. But the magnificence of the forest of the Doe River valley is a thing of the past; twenty saw-mills and a dozen tanneries strung along the line of the narrow-gauge railroad have done their work effectually. First the Black Walnuts went, and then the Cherries, for which this valley was famous. When these were consumed, the lumbermen turned their attention to the Yellow Poplar (*Liriodendron Tulipifera*); their work has been done thoroughly; stumps of this tree seven or eight feet across are common enough, but the big trees are all gone. Now they are cutting White Oaks, and the Hemlocks for tan bark. Large Hemlocks, however, can still be found near the streams, and on the first bench above the river stand as fine Chestnut-trees as can be seen on the continent.

At Roan Mountain Station the rail is left and the journey to the summit of the mountain is made over an excellent road. The distance is only twelve miles, the summit being easily reached in four hours. The ascent is of peculiar interest to the lover of trees, who will see a great variety and many noble specimens. At the sheltered base of the mountains, *Magnolias* abound, and then the road winds upward gradually from these and their relative, the Tulip-tree, through White Oaks and Chestnuts, Lindens and Red Oaks, Buckeyes, Birches, Sugar Maples and Hawthorns, until, as the upper limits of the forest are reached, its conspicuous features are the Black Spruce, the Balsam, the Striped Maple, the Mountain Maple, the Beech, the Yellow Birch, and the Mountain Ash, that is to say, the inhabitants of the sub-arctic forests of North America. In this short drive, therefore, of twelve miles, are to be seen trees which, at the sea-level, are scattered through more than ten degrees of latitude. On the western slopes of the Big Smoky Mountains in Tennessee, individual trees are, perhaps, larger, and the number of species rather greater than in the forests of the Roan, but in no place easily accessible to travelers unaccustomed to rough mountain travel can the Appalachian forests be seen so well as on this mountain.

If the journey is made, as mine was, in the last days of June, a wonderful sight awaits the traveler as he emerges from the forest on to the long grassy summit for which Roan Mountain is famous, for at this season the Mountain *Rhododendron* (*R. Catawbiense*) is in bloom. The summit is in the form of a saddle several miles long, the extremities being formed by two elevations of about equal height (nearly 6,800 feet); up to the edge of this open space the advance of the forest is pushed in irregular outposts, sometimes in narrow lines, and sometimes, where the shelter is better, in solid blocks of a few acres in extent. Along the borders of the forest, sometimes scattered individually, and often in broad masses, covering hundreds of acres, the *Rhododendron* grows mixed with bushy plants of the Mountain Alder (*Alnus viridis*).

No one can judge of the extent of the Rhododendron-fields on this mountain, for the scale is so vast that the eye cannot estimate areas; certainly there are spots on the summit from which thousands of acres covered with Rhododendrons and Alders can be seen at once. The thickets are impassable except where bears and cattle have forced tortuous trails among the bushes which ten days ago were covered with flowers; these are nearly all of one color, deep rosy pink, very similar in shade to that variety known in gardens as *Roseum elegans*, although an occasional plant with darker flowers can be found. An examination of the conditions under which Rhododendron Catawbiense thrives in its home on this mountain will show the treatment its hybrid descendants require in gardens. The soil where the plants are growing, and, indeed, over nearly the entire summit, is rich black vegetable-mold, varying from eighteen inches to two feet in depth; although saturated with moisture, as small springs are common, the surface-soil is perfectly drained, being underlain by coarse gravel filled with large stones. Abundant atmospheric moisture, for rarely a day passes without clouds settling over the summit of the Roan, increases the vigor of the plants; on the open slopes they rarely grow more than four or five feet high, but when protected by the Balsams (*Abies Fraseri*), specimens twelve to fifteen feet high are not uncommon. These natural conditions seem to indicate that Rhododendrons of the Catawbiense blood require rich, moist, well-drained soil, constant atmospheric moisture and protection from high winds, and that grown under such conditions they can support excessive winter cold as the temperature on the summit of the Roan has been seen to fall, in winter, to 30 degrees below zero of Fahrenheit, while ice probably forms during every month of the year except in July and August.

But the Rhododendrons do not offer the only attraction of Roan Mountain. The views from it are superb. A break in the mountains immediately to the west opens to the eye all the Cumberland system of middle Tennessee; to the south lies in full view the Black Mountain range culminating in Mt. Mitchell, the highest land in North America east of the Rocky Mountains; just to the right of the Black Mountains, Pisgah, a hundred miles away and twenty miles beyond Asheville, stands up boldly and alone, while beyond it, in shadowy outline, appear the high peaks of the Smokies. To the east of the Roan the broken masses of the Blue Ridge are in full view; to the north-east Grandfather raises its massive dome, and to the north the eye, looking out over a sea of smaller ranges, is carried into Virginia and West Virginia. The panorama includes eight states, and, owing to the isolated position of the Roan, is not equaled by that obtained from any other Appalachian mountain.

Many summer days may be pleasantly passed in wandering over the summit of the Roan, in admiring the ever-changing views, in exploring the wild flowers which cover its slopes and cliffs, or stretched on the soft masses of the Sand Myrtle (*Leiophyllum buxifolium*, var. *prostratum*), most delightful of the high Appalachian under-shrubs and the softest of beds, in studying the aspects of the forest, with its countless tones and shades, or in watching the eagles soaring high over the cliff which bears their name. The atmosphere is cool and bracing, the temperature rarely rising to seventy degrees, Fahrenheit, in the middle of the hottest days; the nights are always cool, and black flies and mosquitos are unknown. A residence on the summit is said to be a certain cure for hay-fever, and last, although not least, the accommodations in the Cloudland Hotel, built in the depression of the saddle at an elevation of a little more than 6,000 feet above the level of the sea, are excellent.

Leaving the summit of the Roan several roads are open to the traveler. If he is in a hurry to return to the north his quickest way is by Johnson City and the Shenandoah Valley. If two or three days more can be devoted to mountain travel he can descend to Roan Mountain station, continue up the narrow-gauge railway to Cranberry, and then ride through the mountains by the new settlement at Linville to Hickory, on the Western North Carolina Railroad. Another route is by Bakersville, on the North Carolina side of the mountain, now reached by a rough trail from the summit, and then by road through a picturesque region to Marion, a long day's ride, or by a road directly into Asheville, a longer and less picturesque journey of seventy miles. It must be remembered that the roads in all this mountain region are bad, and sometimes almost impassable for wheels, and that it is less fatiguing to ride than to attempt to drive. Pack-animals are little used or understood, and it is better not to attempt to carry any luggage that cannot be packed behind the saddle.

The mountaineers are uniformly kind and hospitable, and

do all that they can to make the traveler comfortable, but their manner of life is very primitive, and a "pone" of corn-meal, a dish of honey and a pitcher of buttermilk often exhaust their supplies. If this seems too simple fare, or the fatigues of a journey in the saddle are too great, one can see what is most beautiful in the Appalachian country, and get an excellent idea of the Appalachian silva from a visit to Roan Mountain, a journey which is not more difficult or fatiguing than a trip to the Catskills or the White Mountains.

New York.

S.

Periodical Literature.

The Forms of Trees.—II.

LAST week we quoted part of a paper on this subject, which was read before the California Academy of Science by Mr. Gustav Eisen, in which the influence of wind and snow was chiefly considered. The following is a continuation of the same paper, in which the effects of sunlight and heat upon the forms are discussed:

"Another important agency in shaping the forms of trees is the direct sunlight and heat. As the force of the direct rays of the sun is different in different places, it follows that their effect upon trees and shrubs must vary with the locality as well as with the physiological structure and nature of the plants. Various other agencies, such as the moisture in the air, the force of the wind, the rainfall, dews and fogs, combine with the sunlight and heat, either in decreasing or increasing the effects. It is especially in warm and dry regions where the heat and light are all-powerful in modifying and directing the development of the form of a tree or shrub. An excess of heat and light is nearly always hurtful, and may even be so injurious as to kill the trees, or make them unfit for the region. It is especially the horticulturist that notes these effects of heat and light. In tender plants the effects are more pronounced and principally of two kinds. The direct rays of the sun injure the stem or trunk on the south-west side, or on the side on which the greatest force of the sun-rays are concentrated during or shortly after midday. The tender bark and cambium are scorched, dry up and prevent the sap from circulating. In course of time injurious insects, such as borers of various kinds, find their way through crevices, and parasites gradually destroy the trees. Trees which are thus especially tender are, among cultivated trees, Apples and Pears, and among wild trees, Weeping Willows, Poplars, young Oaks, Maples, etc. A tree when once injured seldom recovers if left to itself, but dies, or at least becomes sickly. In order to counteract this fatal force of excessive light and heat combined, the horticulturist encourages lower limbs and foliage, prunes his trees low, or otherwise shades the exposed parts. Nature works very much in the same way. Young trees growing in heated regions are covered with lower limbs thickly set with foliage, or develop large weeping tops or crowns with drooping branches, which shelter the tender stems as effectually as if they were covered with an umbrella. That such a shade is absolutely necessary can be clearly demonstrated. There is, for instance, no more tender tree than our common Weeping Willow, a native of the hot region of Asia Minor. This tree flourishes even in our warmest regions under proper conditions of moisture, as long as its natural form is not interfered with. But let any one prune back its limbs and cause the direct rays of the hot sun to strike its trunk, and the tree will soon become diseased and die. The dying of Weeping Willows is common all over the warmer parts of this state, and is everywhere to be principally ascribed to the cutting away of limbs and to the entrance of heat and direct light.

"The excessive heat and light have also a bad effect upon the ground in places where rain or other moisture is scarce. The sun dries out the soil and makes it too dry for the trees and plants. To counteract this heat, nature causes lower limbs to spread out as close to the ground as possible, or furnishes the tree with large, dense and rounded crowns, which cover the soil with shade and prevent the moisture in the immediate vicinity of the trunk and roots from drying out.

"Nature furnishes also other remedies, such as peculiar position of the leaves, tough and hardy bark, gray and light colors of leaves and stems, hairs or cells especially constructed to withstand evaporation or heat.

"While the snow especially affects evergreens, the heat and light affect evergreens and deciduous trees almost alike.

"In the tropics the intense heat develops another tree form, the umbrella form. In this region the heat is always accom-

panied by moisture, and is thus never excessive or dangerous for trees which naturally seek the light. The moisture and heat combined produce a most vigorous and dense vegetation, the very opposite to what is found in the arid zones. The effort of the tree is therefore concentrated in its endeavor to reach the light and to push out from the dense shade nearer the ground. The most vigorous growing trees in this region send up straight and undivided trunks to a level with the top of the dense undergrowth, branch at this level and form immense umbrella-like crowns above less vigorous trees. This umbrella form gives to the tropical landscape a distinct and characteristic appearance. A tendency to assume such an umbrella form can also be recognized among those trees of the temperate zone which grow in moist places, such as river-bottoms, cañons and other sheltered localities—trees, in fact, which delight in moisture. But nowhere is the form so pronounced as in the tropics, where it is common with all large species of the denser forests. The uplands of the tropics, where the rainfall is less and where heat and drying winds are more powerful, and where, accordingly, the vegetation is less dense, the umbrella form is rare, or where it exists is caused by other agencies.

"The origin of the tropical umbrella form is, therefore, not exactly identical with that of the umbrella form assumed by most Pines in such districts as the Mediterranean or the Gulf region of the United States, and, to a certain extent, also by a few more northern Pines. This umbrella form is caused by the falling off of the lower branches, which never possess the strength of the upper limbs. The umbrella form, however, greatly favors their struggle against wind and heat.

"In these drier places in the tropical districts the umbrella form gives place to the globular form, the conditions there being quite similar to what they are in the drier regions farther north. Observe, for instance, the form of the Ceiba (*Bombax Ceiba*), which inhabits drier localities in the Central American tropics. This tree is almost globular in shape, in order that its branches may give necessary shelter to the trunk and to keep away the reflected heat. An effort to change the form of this tree by pruning results fatally, as the branches become sun-scalded and a prey to borers, which eventually destroy the tree. In crossing Central America I was especially impressed by these different tree forms, characteristic of different regions. Along the lowlands of the Pacific coast, up to 2,000 to 3,000 feet, the characteristic form of the various strong-growing trees was the umbrella form. Above 3,000, and from that altitude toward the interior in the dry and warm district, the globular form predominates. As we ascend the interior highlands in the vicinity of Coban the climate suddenly changes and becomes very moist. With this change comes also a change in the form of the trees, which here assume the regular umbrella form. The same climate continues uninterrupted to the Atlantic coast, and the district is characterized throughout by the predominating umbrella form.

"All trees require more protection when young, and this explains why young trees are shaped differently from older trees. Thus the form of a young specimen of the common Blue Gum (*Eucalyptus*) is well known. While young the tree is pyramidal, and the sloping branches are covered by horizontally extended leaves. No form can be more adapted to withstand heavy winds. As the tree grows older, the stem stronger, and the roots penetrate deeper, this original form is not required any more, and the tree assumes a semi-umbrella-like crown.

"If we consider the principal forms of trees in their connection with influences of wind, snow, rain, sunshine and heat, we find that the various forms may be grouped principally under the following heads:

"(1) The upright form, with a central undivided trunk and with downward sloping branches. This form is possessed by most conifers inhabiting snow-visited regions. The downward slope of the branches facilitates the shedding of the snow, while the undivided trunk offers less resistance to heavy loads of snow. Forked or branched trunks would split or break.

"This form may be either necessary to the species, as when the latter is confined to snow-visited districts (example, *Picea amabilis*), or it may be inherited and continue as a characteristic of the species which grows in a warmer climate, but which evidently had been evolved from a species which once inhabited colder regions. Example: the Redwood (*Sequoia sempervirens*), Lawson Cypress (*Cupressus Lawsoniana*) and many other evergreen trees inhabiting the moist, snowless climate of the Pacific coast north of San Francisco.

"(2) The upright form, with erect or horizontal branches. The upright trunk in this form must be considered as inherited from ancestors where it was a necessity. Later on the sloping

branches gradually assumed a horizontal position. Example: most species of Cypress, Yew, Juniper, etc., of a more southern origin. It is interesting to note the form of *Cedrus Deodara*, or Himalaya Cedar. This tree, growing in regions of Himalaya where heavy snowfalls are not infrequent, possesses while young characteristically downward sloping branches. *C. Libani*, Lebanon Cedar, which is only a form of *C. Deodara*, possesses no such sloping branches, but horizontal branches, evidently developed in a climate where the absence of heavy snow has made the downward slope of the branches unnecessary. Most species of Juniper possess erect branches, as would be expected in a genus which finds its most congenial home and greatest development in the warmer regions of the Mediterranean, where snow is almost unknown.

"One species (*Juniperus communis*), however, which is common in northern Europe, is distinguished by a very different form from the southern species, being dwarfed, prostrate, and repeatedly branched. But that this form of the European Juniper is not the natural one, can be seen by the fact that whenever this species is transferred to snowless localities it at once assumes the upright form, growing as straight and slender as a southern Cypress. Similarly we find this upright form possessed by all specimens of this Juniper which grow in close proximity to smelting works, where the heat is strong enough to melt the snow. The different appearance of this Juniper in such localities is really most startling.

"Pines which inhabit snow-visited regions are, as a rule, very upright, with downward sloping branches, while the southern Pines, both in Europe and North America, as well as in Central America and Mexico, have branches which either spread horizontally or which stand erect. Compare, for instance, *P. Lambertiana* and *P. Cembra*, which inhabit snow-visited regions, with such species as Aleppo Pine (*P. Halapensis*), *P. maritima*, *P. insignis* and *P. Sabiniana*. Judging by the forms of most species of Pines, it would seem as if this genus is more of a southern origin than, for instance, the various genera of Firs and Spruces which, through their very characteristic undivided stems and sloping branches, indicate their origin in the snowy regions in the north.

"(3) The globular form. This form is possessed by trees in warm and dry regions or localities. The object of the form is to protect the tree from sun and heat and to preserve the moisture in the soil around the root. Example: the Live Oak, the wild California Walnut, the Texas Umbrella and the tropical Ceiba, or *Bombax-tree*. The Mesquite of the Mojave Desert belongs to this form.

"(4) The umbrella form. This form is principally found in moist tropical climates. The object of the form is to give to the tree as much sun and heat as possible, which can again only be had at a certain altitude above the tops of the dwarfing vegetation. Example: various papilionaceous trees, as well as most varieties of trees in the tropical lowlands of both continents.

"In connection with this, I will call attention to the form of the bases of the trunks and of the surface-roots in trees growing in moist places, especially in the tropics. The trunks branch out above the soil and form peculiar horizontally compressed roots, sometimes five to six feet high, but only a few inches thick. Such surface-roots are found in most tropical trees, as well as in many swamp trees; for instance, the Swamp Cedar of the Mississippi delta. The object is to steady the tree when floods or excessive rains soften the ground; round roots would then offer much less resistance."

Notes.

Excellent peaches from Georgia are now offered on all the fruit-stands of this city.

Dr. Ignatius Urban has just issued in separate form his *Addimenta ad Cognitionem Floræ Indiæ Occidentalis* from the fifteenth volume of Engler's *Botanischer Jahresbericht*. It contains descriptions of new Antillian species, with critical notes on others, based principally on recent exploration in the West Indies.

What promises to be a work of much value to the many horticulturists in America who read German is the recently announced *Forsliche Botanik* (Forest Botany), of Dr. Franz Schwarz. It will be published by Paul Parey in Berlin, will form a large octavo volume illustrated by two plates in photogravure and 456 wood-cuts, and will be sold for 15 marks.

On the roof of the New York State Building, in the World's Fair-grounds at Chicago, which is to be built by Messrs. McKim, Mead & White, three terraced gardens will be ar-

ranged. Doubts have been expressed whether, owing to the heavy, smoke-laden air of Chicago, the recent movement to popularize roof-gardens in the city itself will be successful. But during a single summer, when neither pains nor cost will be spared to maintain them, those on the New York State Building will probably be made very beautiful features.

Mr. H. E. Van Deman, of the United States Department of Agriculture, writes to *Orchard and Garden* that in Norfolk the Hoffman Strawberry has been selected as one best suited for market purposes. Its points of excellence are the earliness, firmness and good color of the fruit, the vigor of the plant, and the stiffness of the peduncle, which holds the fruit well up. The defects of the berry are poor quality as a desert fruit and moderate productiveness. Early, clean and firm berries which will endure shipment to distant markets are the great points which the market-growers desire.

Some thirty students attended the spring course of lectures on New England trees and shrubs, recently concluded at the Arnold Arboretum. More than half of them were school-teachers from Boston and its neighborhood, while the remainder were mostly persons who are in charge of parks or large private grounds. The lectures were specially adapted for the instruction of persons who have no botanical knowledge, and dwelt upon the useful and ornamental properties of the plants in question, their habits of growth, characteristic diseases and other peculiarities. An autumn course of fifteen similar lectures will begin on September 7th.

A monument is to be erected in Paris to the late Monsieur Alphand, the famous landscape-gardener and director of public works. The committee in charge of the matter, which includes Puvis de Chavannes, Charles Jacques and other artists, as well as officers of the Government, appointed one of its members, Charles Garnier, the architect of the Opera House, to designate the most suitable site. He pronounced in favor of some point on the avenue which leads to the Bois de Boulogne, and this suggestion has been adopted by the committee. The monument will be architectural in character, and its preparation has been confided to Monsieur Formigé.

"Rosemary," says a German writer, "in southern Europe is plaited in a bride's hair. It is also used to sprinkle holy water on the coffin in which, with other flowers, it is used for decoration, and it is carried in the bouquets of the mourners. It is commonly planted on graves. Yet, hung on the entrance to the house or porch, it brings good luck to the household, and protects against thieves. Moreover, it possesses the power of renewing youth. There is a tradition that a very old, queer, shriveled queen was helped by means of a recipe which she was careful to bequeath to her heirs. It prescribed: Six pounds of Rosemary, crushed in a mortar, mixed with water which was to be bathed in thrice a day."

In a recent number of the *London Academy*, Mr. H. A. Evans called attention to the fact that when Shakespeare twice mentions the potato (in *Merry Wives of Windsor*, V. 5, 21, and in *Troilus and Cressida*, V. 2, 56), it is the sweet-potato, not the white potato, that is meant. The contrary fact has usually been assumed by commentators, and by dictionaries which include the quotations to which we refer. But *The Century Dictionary* is more accurate. It says that the first meaning of potato as an English word was sweet-potato, and that it should thus be understood whenever it occurs in works written before the middle of the seventeenth century. This meaning, it adds, is now obsolete in England; and the sweet-potato itself is scarcely known except by name to our transatlantic cousins.

A month ago the Earl of Roseberry formally opened Brockwell Park, and South London is now provided with one of the very prettiest of all the parks of the great city. It is not so extensive as some of the others, since it covers only seventy-eight acres, but the ground presents an unusual variety for its extent. It is finely timbered, undulating in surface, and much of it is thoroughly picturesque, showing bits of scenery which artists delight to paint just as they find them. Altogether, it has an appearance of rural remoteness, and it is the purpose of the superintendent to develop the natural beauty that is already there rather than to attempt any grand scheme of creation. It will contain, however, an old-style walled-in garden, laid out in geometrical Dutch style. This is not new, but already exists with its old fruit-trees and crumbling walls and general air of seclusion, so that it was wise to preserve it and continue it as a genuine old-fashioned garden, which will offer a piquant contrast to the natural grounds about it.

The latest issue from the botanical department of the University of Nebraska, being the third of the new series of its contributions, consists of a second edition of Webber's *Appendix to the Catalogue of the Flora of Nebraska*, with a supplementary list of recently reported species by Professor Charles E. Bessey. Mr. Webber's Catalogue was originally published in the sixth volume of the *Transactions of the Academy of Science in St. Louis*, bearing the date of March 12th, 1892. Professor Bessey's supplementary list contains one hundred and seventy species discovered since Mr. Webber's paper went to press. It contains mainly the plants collected by Mr. Rydberg in the western counties, with others made by members of the University botanical department, and by Dr. Hapeman, of Minded, and the Rev. J. M. Bates, of Ballyntine. A periodical publication of all additions to the flora of the state will stimulate, Professor Bessey suggests, botanical students to a closer study of its flora, and encourage them to deposit specimens of newly discovered species in the University Herbarium. Correspondence is solicited by the department of botany to further this end.

Mr. Albert Koebele, who is in Australia collecting beneficial insects, has sent to the State Board of Horticulture of California a new Lady-bird that preys on the Cottony Cushion Scale. It was through the instrumentality of Mr. Koebele that the *Vedalia cardinalis* was introduced into California and accomplished a work which was without precedent in the annals of economic entomology. This new Lady-bird is called *Novius Koebelei* and slightly smaller than *Vedalia*, the mature beetle averaging about one-eighth of an inch in length. Only three specimens were received, and these were placed in a small jar infested with the scale. One of the insects died, but two of them changed to the chrysalis state, and in a few days perfect beetles emerged, which were, fortunately, male and female. Three days later the female deposited eggs, which hatched in five days. The young larvæ were carefully reared, and, after passing through three molts, changed into the pupa state, and fifty-five perfect beetles were secured in just thirty-one days from the egg. When liberated on trees they will, no doubt, pass through their transformation in much less time, so that there will be thousands of beetles for distribution very soon. It is to be hoped that they will be as efficient as the Lady-birds of Mr. Koebele's original importation.

The great mass of flowering shrubs have passed their blooming season by the end of June, but those who enjoyed a visit last week to the grounds of Mr. Charles A. Dana, at Dosoris, Long Island, observed four shrubs in particular which were flowering finely, and all of them natives. The first of these was the White Swamp Honeysuckle, *Rhododendron (Azalea) viscosum*, which was still bearing its showy clusters of flowers, some of them pure white, others ranging to pink or pale rose color. Near a group of these *Azaleas* was a specimen of *Stuartia pentagyna*, an American representative of the Tea family, which is a native of the mountains of North Carolina and Georgia. It is pretty generally hardy in this latitude, and although it is one of the most attractive of summer-blooming shrubs and has been cultivated for more than a century, it is still so rare in gardens that it has no common name. The flowers are three or four inches across with cream-white petals, and resemble some of the single *Camelias*. The Oak-leaved *Hydrangea* is another shrub from the same region which was figured as long ago as Bartram's time, and yet is comparatively rare. On the banks of streams in its native home it sometimes attains a habit almost tree-like and a height of some fifteen feet. The specimens on Mr. Dana's grounds were not so large, but the long thyrsoid panicles of white flowers are very showy. The panicked *Hydrangea (H. paniculata)* resembles this in its inflorescence, but its flowers were not yet fully expanded. This, too, is a beautiful shrub, and although it was sent out long by the Messrs. Parsons & Sons, of Flushing, it is rarely seen. Its variety *Grandiflora*, which, to our taste, is not so attractive, has become very common in gardens. The Michigan, or Prairie, Rose (*Rosa setigera*), and the only American Rose with climbing stems, was here trained to a pillar, and made a beautiful picture. It was covered with corymbs of large single flowers, some of them nearly three inches across, of a deep rose color on their first appearance, but turning nearly white before they fade. These immense clusters in the greatest profusion, backed by the broad handsome foliage of this plant, make it very desirable, and when grown in good soil and fed generously it is more beautiful than any of the double-flowered climbing Roses, such as the Queen of the Prairies and the Baltimore Belle, which have been derived from it as a parent.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLE:—The Love of Nature.....	337
The Gardens at Wellesley, Massachusetts.....	<i>Mrs. J. H. Robbins.</i> 338
The Old-time Southern Garden.....	<i>O. W. Blacknall.</i> 340
In the Company of Trees.....	<i>Mrs. Danske Dandridge.</i> 340
The Manufacture of Perfumery at Grasse.....	340
PLANT NOTES:—Some Recent Portraits.....	341
NEW OR LITTLE-KNOWN PLANTS:— <i>Corylopsis pauciflora</i> . (With figure.).....	342
CULTURAL DEPARTMENT:—Fruit Notes.....	<i>E. P. Powell.</i> 342
Notes on Shrubs.....	<i>J. G. Jack.</i> 343
Cyclamens and Chinese Primroses.....	<i>W. H. Taplin.</i> 343
Perennial Larkspurs.....	<i>E. O. Orpet.</i> 344
Melianthus major, <i>Jatropha podagrica</i> , <i>Geranium Henry Cox</i> , <i>Linaria cymbalaria</i> , <i>Berteroa mutabilis</i> , <i>Ipomoea Bronsoni</i>	<i>J. N. G.</i> 344
THE FOREST:—Our Land Office System.....	<i>H. B. Ayres.</i> 345
CORRESPONDENCE:—Plant Diseases in West Virginia,	<i>Charles Frederick Millsbaugh.</i> 345
How Cold Air Settles in Hollows.....	<i>C. L. Mann.</i> 346
The Rose Hill Nurseries.....	<i>G.</i> 346
RECENT PUBLICATIONS:—The <i>Silva</i> of North America.....	<i>Professor L. H. Bailey.</i> 346
NOTES.....	347
ILLUSTRATION:— <i>Corylopsis pauciflora</i> , in Dr. Hall's garden, in Bristol, Rhode Island, Fig. 59.....	342

The Love of Nature.

ONE of the noticeable characteristics of this century is a growing love of natural scenery, but it may be questioned whether the love of nature is also growing, for a distinction must be made between the two. The first is a simple emotion—an instinct rather than a faculty—and, like all primitive instincts, it lies at the very foundation of being, having its roots somewhere in that mysterious region below consciousness. Perhaps it is stronger among the savage than it is among the civilized races of the world, but it is yet the birthright of every healthy child.

The appreciation of natural scenery, on the other hand, is a complex emotion which involves thought, memory and imagination, and as it rarely manifests itself in childhood it probably did not exist in the childhood of the race. Wherever this appreciation is found, whether among modern nations, among the Hebrews as indicated in their literature, or among the Greeks and Romans, as is evident from the skillful way in which their architectural creations were placed with reference to their natural surroundings, it is the outcome of an advanced, perhaps of a decaying, civilization. The towering mountain stirs the imagination of the boy, but it is to deeds of exploration and adventure. The dense forest lures him, but its chief attraction is the game it covers. The brook which sparkles through the meadows delights him, because it turns his water-wheel or excites his hope as an angler. And yet, blind as he may seem to the grandeur of the one or the beauty of the others, mountain, grove and stream, each plays its part in molding the boy's taste and character, and in after years he will be drawn to them by a deeper love, because they are inseparably blended with the careless happiness of childhood and youth. It is through some experience like this that the race has passed. Earth first ministers to man's necessities; in so doing it develops his faculties and awakens new powers, until at last, when he has gained dominion

over it, the ability to discern its beauty comes with the leisure to enjoy it.

The pleasure which springs from the contemplation of a beautiful landscape differs in kind with each spectator. It may have no deeper source than the mere love of beauty, and it is then refreshing to the jaded spirit simply because the beauty is pure and appeals to no sordid or material interest. But when to the beauty of a landscape is added the charm of romantic and historic association, the pleasure it awakens is lifted above the region of the purely sensuous into the realm of sentiment and imagination. To the man of religious spirit, to whom the visible universe is but the thought of God made manifest, the mountain gloom and the mountain glory speak first of the majesty and dominion of the Most High; while the smiling landscape, with its suggestion of happy homes and sheltered lives, brings tender thoughts of Him who notes even the sparrow's fall. Among the same scenes the man of science, if he has not sacrificed all the poetry in his nature in the search after material truth, will be lost in wonder that the tumultuous and conflicting forces which have lifted the mountains from the depths of the sea and crowned them with everlasting frost can yet in obedience to the same immutable laws subdue their might to offices of tender grace, can stoop to paint the lily and add perfume to the violet. And so to each the landscape has its mission; to the dilettante it brings a fresh sensation; to the man of feeling a noble emotion; to the man of religion, thoughts of devotion and gratitude; to the man of science, reverent wonder at the mystery and majesty of natural law.

The love of nature, at first an instinct, springs from a deeper source than the admiration of scenery, and it may, when disciplined and chastened, awaken a still more profound delight. The heaven which lies about us in our infancy may be at first only a dim consciousness of the universal life of nature, that life which throbs in every tree and shrub, the instinct in every clod "which comes to a soul in grass and flowers." It may be an inheritance from some far-off age, when man was nearer nature's heart than now, some memory of which haunts the mind of the growing boy and brings much of the unconscious joy of childhood. Most of us know too well how this "vision splendid" fades into the light of common day, but when in some fortunate individual it is retained through manhood, is assimilated by the intellect and shaped by the imagination, it becomes "the vision and the faculty divine," the rare gift of the poets of the race. Every one who retains it as a conscious possession is at heart a poet though he may lack the poet's gift of expression. The lover of natural scenery is wont to talk with eloquence of the pleasure he finds in the contemplation of landscape beauty, but the true lover of nature says little of his joy. He cannot measure or describe it, but when alone in the dense forest or in some sunny glade a mysterious sense of kinship with the silent forces working all about him, or a dim consciousness of a haunting presence, comes to him unbidden and ravishes his soul with suggestions of a more awful beauty some day to be revealed, and after such hours of communion with nature he can return to the noisy world refreshed in spirit and strengthened for the inevitable conflicts of life. It is only the chosen few whose early affection for nature has become a controlling passion who enjoy in full measure this vivifying power.

Since the love of natural scenery may be cultivated, why may not the child's love of nature be preserved? Like other fine instincts, it requires delicate handling. It too often vanishes early, crushed out by hard necessity or crowded out by the insincerities of an artificial life. Nature does her utmost to retain her hold upon the child, the flickering sunbeams tempt him, and every moving shadow has a charm even in his mother's arms. The flowers of the field are his chosen playfellows as he grows; trees whisper to him their secrets; all the myriad sights and sounds of earth and air woo him with their promises of happiness, and while the enchantment lasts the little traveler needs no

other guide through the labyrinth of beauty about him than his eager curiosity. But as this begins to wane would it not be wise to direct his attention a little deeper to the infinite variety of leaf and flower, the endless diversity of form and structure in bird and insect, shell and crystal? As his mind expands why not take him into Nature's workshop to note some of the slow and mysterious processes of growth, the circling of the sap, the perfection of the flower and fruit? Surely some dim wonder at the miracle which binds all the forces of the universe to each tiny germ in fulfilling its destiny, will fill his awakening soul with as deep a delight as that which in his earlier years greeted his keen and eager senses. In this way the study of natural science could begin without its drudgery; the child's powers of observation would increase with their exercise, and the closer investigation of nature about him would keep his interest as fresh as it was when he first began to look and listen. And so as his faculties one after the other are enlisted in the delightful work, he "hearing gains who had but ears, and sight who had but eyes." Is it too much to say that if the original love of nature, which is every child's inheritance, was thus fostered and cultivated, that he would never lose that instinctive delight in the natural world, but that this delight would be slowly transmuted into the possibilities of a deeper and richer joy as maturity was reached?

To speak of gardening as an occupation for children in connection with a subject of such profound philosophy would seem at first to detract from its dignity, but nature has been before us and has implanted in the child the impulse to dig, which awakens almost as early as the desire to catch the sunbeam, and which is quite as vital, perhaps, to its perfect development. It is the law of our growth, that the finer gifts or graces can only be gained on the condition that their acquirement is not the object sought. Thus the child who is set to work in a garden of his own as soon as he has the moderate amount of strength and skill to begin the work, will glean a much richer harvest than the flowers or fruit which will be one reward of his toil. We most love that for which we have made some sacrifice, and, therefore, the growing things upon which the child has spent his tiny strength will be far dearer to him than the finest blooms of his father's greenhouse, while his interest in their relatives of the field and forest will be retained and strengthened by many associations.

This diversion in the garden, therefore, will help to keep fresh and strong the original love of nature which is the child's inheritance, so that he will be more likely to carry it with him into the strenuous work of manhood. So much has been said already in these pages of the influence of gardening upon character, that there is no need of enlarging upon this branch of the subject, but it may be worth while to invite attention to one among the benefits to be derived from early familiarity with the garden and its cultivation, which is rarely, if ever, taken into account. The child will love his garden and be happy in it. When early manhood comes, and during the busier years when he must test his strength in the world of men, his garden, like other pleasures and interests of boyhood, will take a subordinate place, but in the evening of his days, after the stress of his life's work is over, there will inevitably return the longing to possess and transfigure some portion of the earth's surface. This desire comes naturally to almost every man. The idea of rest in declining years seems to be inseparably connected with rural scenes. The paradise to be regained is never within the walls of cities. This is true even of the city-born and city-bred, and it is doubly true of one reared in the country, and when such a one takes up with renewed interest the occupations of his boyhood he finds, to his surprise, that in addition to the flowers or fruit which reward his care there is an ideal harvest of associations which may make his closing years rich with a beauty and a pathos all their own. Every leaf and flower touches some mystic chord of memory and association, and as he rests under the shelter of his Vine and Fig-

tree the glory of that far-off time gilds his downward pathway with a tender radiance and revives the spirit of that early day when,

—meadow, grove and stream,
The earth and every common sight,
To him did seem appareled in celestial light.

It appears from the seventeenth annual report of the Board of Park Commissioners of the city of Boston, which has just appeared, that, up to the present time, eight millions of dollars have been expended on the park system—about three millions and a half having been devoted to the purchase of land, four million three hundred thousand dollars to construction, and rather less than two hundred and fifty thousand dollars on maintenance. Considerable progress has been made during the past year in completing the system, although none of the parks are yet finished, with the exception of the Charles Bank, a small marine esplanade on Charles Street, in the city proper. None of the great parkway, which ultimately will stretch from the end of Commonwealth Avenue, passing through the Back Bay Fens, embracing Jamaica Pond, skirting the Arnold Arboretum and Franklin Park, and finally reach the marine park in South Boston, is yet open to the public. This, however, will be the great feature of the system, and will furnish a continuous and interesting drive of about fifteen miles. Boston, in spite of the liberal expenditures which the city has made in the last seventeen years, is still very poorly provided with parks. Franklin Park, of five hundred acres in extent, is the only park in the whole system in the true meaning of the word, and the only one where large masses of people will be able to find rural enjoyment and repose. Serious efforts are now being made to increase the park area in eastern Massachusetts, and it is not improbable that large bodies of unimproved forest-land, like the Middlesex Fells north of the city, and the Blue Hill range south of the city, may be added to the park system of greater Boston, which, if the growth of the last few years is maintained, seems destined to become one of the great centres of human habitation.

The Gardens at Wellesley, Massachusetts.

AMONG the pleasant excursions to be made in the suburbs of Boston one of the easiest and most agreeable is the trip to Wellesley, where there are many things to see that are of interest to the lover of trees and gardens. The grounds of the college are attractive from their fine natural capabilities, of which the best is unfortunately not being made, and I hope that before long the advice of some expert will be taken with regard to the class-planting of trees, or great confusion will result. It strikes me that if, for the present, each class should celebrate its anniversary by cutting down instead of planting a tree, it would perhaps be of more advantage to the picturesque development of the property.

The situation of the college grounds is delightful. The surface is irregular and well wooded, and there is a beautiful lake to form an attractive feature from whatever point it is observed, but the opportunities for vistas are greatly neglected, and the elevation on which the college stands is dotted all over with meaningless groups of trees, which detract from the dignity of the really imposing site. There is no outlook upon the lake from the balcony of the main building, as tall trees wholly intercept the view. If some of these are necessary for shade, it seems as if it still might be possible to arrange openings through which the lovely sheet of water might be seen, and thus enhance the beauty of the outlook from the handsome hall, which would then command a delightful scene from which it is now at midsummer wholly cut off.

Another thing which struck me as particularly reprehensible, was an ugly straight row of Copper Beeches, planted between the avenue and the woods. This avenue was planted with taste by the original proprietor, Mr. Durant, with Elms, which have attained a good size and now shade it agreeably. Between this row of Elms and the dense woods on the right a fine smooth stretch of grassland had been appropriately left, which produced an excellent effect, but the row of small purple Beeches, apparently of recent introduction, into the very middle of this pleasant level green, is a great mistake and

disfigurement. In the first place, Copper Beeches are trees to be used singly and with the utmost caution. At best, they are a discord in a green landscape, which can only be made endurable by a proper resolution into harmony, and even then the best authorities think we should do better without them, as they represent a doubtful note. One tree of this complexion edging a deep green wood is sometimes pleasing as well as curious, but a stiff row of them, parallel with a row of Elms, is as undesirable a feature as could well be introduced into a landscape-garden.

Some of the memorable trees of Wellesley seem also to be set out in the most unfortunate positions. I was shown a tree planted by Queen Emma, of the Sandwich Islands, which is so near a wood that in two or three years it will be completely overshadowed by the branches of the larger trees, and the class-tree of this year is also put where it will never have a chance to develop properly. It seems to me that the college authorities should take the advice of some competent landscape-gardener as to what needs to be done to preserve the beauty of these grounds. A cultivated and well-trained eye should decide where class-trees can be planted with impunity, and dictate what sorts of trees should be employed for the purpose, and how much space should be left between them, if they are to grow into handsome single specimens, and also where groups can be placed with advantage so as not to interfere with the general effect.

The opportunities here are very great, but it is not desirable to transform these park-like grounds into a meaningless mass of ill-assorted trees, which do not compose well with each other or create a pleasing picture. I recognize all the charm of these academic shades, and realize how dear this lovely spot must be to the hearts of its "sweet girl graduates," but all the more, it seems to me, that its future should not be left to irresponsible planters, but that careful provision should be made to preserve and enhance its beauty. As years roll on some of the older trees will die; these should be succeeded by others. A careful system of forestry should prevail, by which the best of the closely planted trees should be protected, and provision made for proper successors to those which must in time be removed.

Above all, more open space should be preserved, as a wide grassy stretch, with a view of the lake, serves to bring out the groups of trees with good effect, and to increase their value in the composition. A careful study of Mr. H. H. Hunnewell's place, on the opposite side of this sheet of water, shows the worth of knowledge of effect and a settled plan in planting. There the lake is utilized to increase the beauty of the scene, with enchanting results.

From the house there are unobstructed views of its silvery surface, the trees being kept when they do not interfere with a satisfying sight of its broad expanse, which combines delightfully with the smooth lawns, the quaint terraces, or the rustic wildness of certain portions of the beautiful grounds. Relieved against it the stately natural evergreens gain a richer majesty, and it combines with the formal surfaces of the clipped Hemlocks and Beeches and Pines in the topiary garden, in a way that recalls memories of ancient villas of renown upon the lakes of Italy, while, contrasted with its blue, the white pillars of the balustrades seem of Attic value.

Those whom its generous proprietor so freely permits to see these gardens may well be grateful for a chance to know in our own land some of the charm that haunts the classic grounds of the old pleasure-grounds of the Colonna and the Serbelloni. Whether such a sight comports with a New England garden is of little moment. Are not our skies as blue, our hills as softly swelling, our summer suns as hot, as those of Italy? Why not, then, capture this Old World charm, this strange fascination that lingers in a sight of the subduing of nature to art, that suggests the pride of princes who would rule all.

I have sat for hours in the deserted gardens of Rome, where once the haughty old Colonnas trod, and sought to find the secret of the way they move one. Why do these straight terraces of clipped Yew, these formal masses of Ilex and Cypress and Holly, these headless statues, and moss-grown fountains, with their trickling streams and vine-wreathed lions, hold so dear a charm that when one comes in New England upon their semblance he must needs be thankful for this reminder of a never-to-be-forgotten past?

I doubt if it is only the mere strangeness of this formal gardening which so appeals to the untraveled multitude that they regard it with interest and wonder; there is something deeper than that, which, I take it, is the mastery of man over nature, his all-compelling hand that forces the stubborn Pines to do his bidding, the wayward Hemlock to bend to his eccentric

will. It is the humanity in it which attracts—which thrills us with an odd satisfaction. This violation of law, this enslavement of wild beauty has a relish for our perverted souls, for is it not our fellow-man who has accomplished this audacity, joined issue with the Creator, defied the eternal forces? Sensation is a complex joy; it cannot always be resolved into its elements, and it is hard to say why, on the shore of a Massachusetts pond, a series of terraces planted with extraordinary pyramids and umbrellas, and broad hedges and columns of foliage, should be as interesting and delightful as they are upon the Lakes of Como and Maggiore, where they are the survival of the fashion of a by-gone day.

Stone staircases lead one down from one level to another; at the base a carriage-drive is separated from the water by one of those white balustrades so familiar in Italy, upon which a peacock ought always to be sitting and pluming his exquisite feathers. Across the water the red walls of the college buildings are picturesquely gleaming through the trees, with little boats moored upon the shore and their feet. Along the edge of the lake winds the carriage-drive, separated from it by a fringe of trees. Strolling on foot along the terraces, even as one does at Isola Bella, of a sudden you find yourself in a rustic garden, stony and wild, where small flowers bloom and Ferns run over the rocks; a winding path leads down a declivity to a pavilion on the edge of the water, where you can sit and look back upon the Italian garden with its strange forms of Pines, clipped to imitate a series of toadstools or umbrellas one above the other, of Junipers personating a pyramid, of Cedars masquerading as gate-posts with round balls atop, of rosy Beeches in square masses as unlike a tree as possible, of a great wall of feathery Hemlocks with a steeple of green at regular intervals along it. For forty years this quaint garden has been planted and maintained for the delight of three generations, and still affords, perhaps, the only specimen of an Italian garden in this country.

The whole of this fine estate of six hundred acres gains interest from the fact that its present proprietor has made it what it is, since 1852, from an uninteresting, flat, sandy arid plain, with nothing upon it originally worth retaining except one large Oak-tree, which has now attained magnificent size. The skill, the patience, the unending labor necessary to evolve all this beauty from such unpromising material, are forever worthy of admiration. Years ago we read the account of the foundation of these gardens in Mr. Henry Winthrop Sargent's supplement to the sixth edition of Mr. Downing's book on landscape-gardening, and were greatly heartened and cheered thereby in our own feeble efforts.

It is hard to realize that even forty years can do so much for a desert, but when, seven years after its beginning, Mr. Sargent wrote his account of it, the place was already noteworthy and interesting. Therefore, who may not take courage to persevere in humble efforts to beautify some barren spot that it may be his fortune to possess? Energy, industry and delight in the work will accomplish wonders, and if any feel discouraged let them come here and look about upon these lofty evergreens in the Pinetum, raised from seed, these stately Oaks and Magnolias and Maples that have grown beneath their planter's eye to their present proud proportions, and then sow his seed, and set out his tree with undaunted faith that he shall live to reap the fruit of his labors and sit beneath the shadow of his plantation while he is yet hale and vigorous.

Not all of us can give to our nurslings the assiduous care and generous treatment that Mr. Hunnewell accords to his, but we may well bestow upon one tree the attention that he has awarded to thousands, and from that one win a proportional satisfaction. Enjoyment, luckily, can be elicited from one acre as well as from a thousand; possibly a concentration of interest upon a limited field may bring in an increased return of satisfaction. So far as my experience goes, the small planter has the same joys and sorrows as the large one; it is merely a difference of scale. In his one Water-lily in a mud-hole, the former may have the same emotions as the latter in a Victoria regia brought to blossom in an elaborate tank with infinite care and pains. The reward, after all, is success in the undertaking, be it great or small. This lesson learned, happiness is within our grasp. Seek the attainable, and no man need be unhappy. If you have room for one Oak, plant your acorn and watch its growth—it is the epitome of a park. Plant your little wood-lot with Pines or Nuts, and cherish the seedlings, you master the lesson of the forest. Work with shrubs if you have no room for trees, with flowers if the space be too limited for shrubs, and from the results achieved will come delight in mastering difficulties, new knowledge, fresh desires, a hearty homely interest in the world about you, a link of sympathy with every son of Adam, who, from the lucky fall of that

idle sinner, has gained a chance to earn his bread by the sweat of his brow.

Hingham, Mass.

M. C. Robbins.

The Old-time Southern Garden.

ONE of the most characteristic features of the old-time southern home of the better class was the garden. The slovenliness of the farm stopped short at the garden-wall, within which all was care and order. Rows were as straight as rays of light, and walks and borders were neatly kept. This was woman's domain, and the women of the south were careful even to scrupulousness.

No seeds were bought. Such a purchase would have been held an unpardonable extravagance. The few northern seeds sold at the south were used in the town gardens. Every gardener saved her own seed, which, after being carefully selected and dried, were hung well up out of the reach of meddling bodies. If any housewife gained a reputation for the excellence of any special vegetable she was pretty sure to be called on to supply half the neighborhood gratis. Among the small slaveholders the manual labor of the garden usually fell on the female house-servants. On the larger farms there was usually a regular gardener. One of the older men, who had been retired from the heavier work of the fields, was usually assigned to the garden, as one was also set to run the mill. If so, he was sure to carry all the superstition of his race into his new calling. The moon was omnipotent in the southern garden. Everything, from the planting of a seed to the cutting of a bean-pole, was regulated by that exacting luminary.

As the system of farming consisted in clearing fresh land as fast as the old was worn out, many farmers used little or no stable-manure in the fields, allowing all of it to go into the garden. Fertilizers were unknown, but droppings from the hen-house answered very well for forcing. The result of this was to make the garden a real oasis amid its too often barren surroundings. The variety of vegetables was not great, but the quality was of the very best. Indeed, even after discounting the enchantment of boyhood, there still seems to have been an excellence in a few of those old-time vegetables which the latter-day varieties have hardly attained, and certainly not surpassed. The originator of new varieties has been more intent on looks than on real merit. This is certainly true of strawberries. I have tried in vain to obtain varieties as fine for the table as those that grew in the old garden away back in the fifties. In every remove from the wild strawberry something seems to be lost in flavor, which no doubt arises from the desire of the propagators to meet the popular demand for large and showy fruit.

Tomatoes had come to be generally grown, though not relished by all to the present extent. Egg-plants I never saw, nor Okra till the seed was needed as a substitute for coffee during the war. Parched and ground, they formed the most popular beverage of those scant times.

In the ante bellum garden the Asparagus-bed, which was an almost sacred spot, responded liberally to the great attention it received. An early cabbage was grown, surpassing in size our present early sorts. Beets were excellent. Only one kind of snap beans was raised, a small green one; and one kind of butter beans, also a small variety. Few persons relished Parsnips or Carrots, though a few were generally grown. Salsify, or vegetable oysters, as it was then always called, was grown and eaten to a much greater extent than it is now.

A flat cymbling, or summer squash, produced on a luxuriant vine, which grew so fast that it was accused jocosely of chasing the frogs out of the garden, was the kind in general use. Pumpkins grown in the low-ground corn-fields were fed almost exclusively to stock. I never saw any cooked, or tasted pumpkin-pie until after the war.

Cucumbers and onions were grown in large quantities and greatly relished by all, being eaten together in vinegar. Vast quantities of cucumber pickles were also consumed. Almost every garden, too, had its Artichoke corner, originally planted by some long-forgotten hand, and now yearly producing enough for pickles without replanting. Irish potatoes were grown in abundance, usually in a "lazy bed," so named from the fact that after planting no further work was required. This bed was a plot in which its potatoes were put about a foot apart each way, lightly covered with earth, and the whole was then covered with leaves and litter to the depth of a foot or more. The yield was enormous, the tubers growing often above ground where the litter gave them full room to expand to the utmost.

Many "lazy beds" afforded potatoes from May till far on into the following winter, the tubers being left in the bed and

taken out as needed. This plan might still be followed with profit to the gardener, especially at the south, where it is difficult to induce late-planted potatoes to grow, or to keep the early ones through the summer and autumn, as they soon shrivel and get bitter. As northern-grown potatoes for seed cost us from \$1.25 to \$1.50 a bushel, many dollars might thus be saved.

One of the most charming features of the old southern garden was its flowers. Except a few along the walk to the front door of the dwelling-house, all the flowers on the place grew in the garden proper. In the typical garden, roses arched the gateway; bushes of tumbling Snow-balls graced the corners; stately Pæonies lorded over the Pinks, and Tulips that bordered the walks; mocking-birds built and sang among the constantly blooming roses, and all the old-fashioned perennial flowers—many of them with quaint local names—were found following each other in their season. Looking backward through thirty years of hazy memories the old garden seems yet a place of ideal attractiveness—the abode of neatness and homely simplicity; the spot in which every member of the household took pride and delight.

Kittrell, N. C.

O. W. Blacknall.

In the Company of Trees.

IF one wishes to be taken into the intimate confidence of a great tree, and to get the full enjoyment of its strength and beauty, he should lie upon his back on the greensward beneath it, cross his arms under his head by way of pillow, and let the eye climb slowly up the mighty trunk from root to top-most limb. Thus have I lain beneath an ancient White Oak; thus watched the infinitely varied play of light and shade through the dense foliage; thus noted the delicate tracery of the leaves against the blue of the sky, and learned by heart each wrinkle of its rugged bark. This is the way to study the varying characteristics of trees, and to learn many a sylvan secret only revealed to the real lovers of nature, upon whom she has graciously bestowed eyes to see and the heart to feel her beauty and her mystery. I have spent a summer afternoon moving slowly from trunk to trunk, from Oak to Maple, from Maple to Sour Gum, from Gum to Walnut, and then to Ash, to Poplar, and back again to the old White Oak, most satisfying of all.

Sometimes the sun would smile upon me through an opening in the boughs, or a light-hearted vireo warble a lullaby; the orioles whistle plaintively; the friendly squirrels pretend to scold, and scurry away from branch to branch, only to hasten back to peep again and drop a tiny acorn on my cheek. The great white clouds sailing far overhead; a distant hawk leisurely cleaving the air on his strong wings; a few drops from a flying scud—all these become stirring incidents, fraught with healing and refreshment to the heat-worn nerves and weary brain of the house-dweller. Should the eyes close into delicious slumber the great tree stands guard over its puny visitor, filling one with a sense of security and of being cared for as by a mighty and gentle nurse.

Thus has it chanced to me to be overtaken by a summer shower, and to be awakened by the first cool splash of rain-drops upon my brow. The Oak had no need of mackintosh and umbrella; it was only necessary to turn the water-proof side of its varnished leaves uppermost, and stand quietly to take whatever came, strong in the security gained by a hundred years of storm and sun. The foliage of the tree protected its sleeping guest as long as possible, but now, with a gentle warning splash, the drops fell more and more quickly; little streams ran down the trunk, following the corrugations in its rough bark; the leaves twinkled merrily as they shed their burden of moisture in my face. Then the sun came out a moment, and the whole tree sparkled joyously like the countenance of a friend who is bringing you welcome news.

Rose Brake, West Va.

Danske Dandridge.

The Manufacture of Perfumery at Grasse.

A CORRESPONDENT of the *Gardeners' Chronicle* has written an account of an inspection of some of the flower distilleries at Grasse, from which we extract a few of the interesting facts.

"In the production of rose essence from 10,000 to 12,000 kilos of roses are needed to make a kilo (two pounds and a fifth) of the extract, which is worth 2,000 francs, or \$400. This is such a costly article that few firms can afford to handle it, and it is usually made only on order given a long time in advance of the time of manufacture in spring. The attar of roses made in Turkey is stronger than that made in Grasse, but not so fine,

perhaps, because the Turks have not such finely perfected machinery as that which is used in the Maritime Alps. Violets and Narcissus are cultivated by tons, only Parma violets being sent to the still, the others not being sufficiently odoriferous. These pale blue and fragrant violets are grown in the neighborhood, and according to the supply or demand, or according to whether it is a good or bad season, these choicest of modest flowers bring at wholesale from one franc to four francs a pound. Sometimes higher prices are paid.

"The best time to visit Grasse is, of course, in the advanced spring, when the general country is an undulating forest of flowers and the air is filled with a thousand odors. Visitors in the spring-time should be about as much as possible in the evening along the well-kept lanes which cross the flower reserves, for then the perfumes are the most powerful and the best appreciated. Situated on a gentle slope of a spur of the Maritime Alps, the view of Grasse and its vicinity is most picturesque, offering ever-changing prospects as the tourist ascends. On the summit of the hills, above the town, a magnificent view is presented of the numerous manufactories, all surrounded by flower-covered fields, a smiling valley beyond them, and a range of hills closing the view of the sea. When the flowers are harvested for the distillery they are brought into sheds, heaped on long tables, and women, who are so scantily paid that they can barely exist, are set to sort them. Old and young women, little boys and girls, all are at it and earn but a miserable pittance. On following the car-loads of flowers into the distillery, one will at first be pleased with the all-pervading perfume, but getting into the depositing sheds this becomes too much of a good thing. The odor is so rank as to lose its fineness, and it becomes only a strong, almost nauseating, smell, which permeates everything damp, even to the handkerchief within one's pocket."

Plant Notes.

Some Recent Portraits.

THE plants figured in the July issue of the *Botanical Magazine* are of less interest than usual to the gardener, who will see in them botanical rather than horticultural subjects. They are: *Synandropadix vermitoxicus* (t. 7242), a stout aroid of Tucuman, an east Andean province, where it inhabits hedges and shrubberies. This plant produces hastate-cordate leaves, and large cymbiform spathes with recurved margins, dirty green on the outer and pale purple on the inner surface, the tubers being described as attaining a weight of four pounds. In its native country it is known as "Cana brabo, the ferocious Cane," because the plant blisters the human flesh. *Disa incarnata* (t. 7243), a small inconspicuous flowering Orchid of Madagascar, and a member of a genus of which Mr. Bolus, who has paid particular attention to it, remarks that "in the variety of its perianth, it is only excelled, perhaps, by that of *Habenaria* and *Catasetum*, and is scarcely equaled by that of any other genus in the vegetable world." To this Sir Joseph Hooker adds, "that, after a careful study of a large proportion of the species of *Habenaria*, including upward of one hundred Indian, I find their flowers to be morphologically uniform as compared with those of *Disa*; nor does this remark apply to the perianth only, it extends to the column and its appendages, and even to the pollinia. I quite believe that if *Habenaria* had been a European genus, it would have given rise to as many genera as *Orchis* and *Habenaria* have—that is, about thirty-five instead of the five included in it by Bolus, and upon much more marked structural characters. From such a dismemberment *Disa* has been saved by its remote geographical position far from the haunts of systematic botanists, and by the sagacity of those orchidologists (Lindley and Bolus) who have devoted themselves to its study." *Gynura sarmentosa* (t. 7244), a climbing plant of the Senecio tribe of Composite, and a native of the Malayan peninsula and islands. It is described as a very elegant climber, with richly colored stems, branches, and involucre, although from its lax habit of growth not likely to become a horticultural favorite, except in tropical gardens, where space is at its disposal. The small flowers

are not attractive, although the habit of the plant, which is said to be the most graceful member of this rather coarse genus, may make it desirable. *Masdevallia leontoglossa* (t. 7245), a native of the mountains of New Granada, and a small, dirty flowered species. *Primula Forbesii* (t. 7246), a Chinese species, and one of the only two known Primroses which are strictly annual—that is, that die after first flowering—although they should, perhaps, be more accurately described as monocarpic rather than annual if, as is probable, they form seedling plants the first year and flower and die in the following. *P. Forbesii* is another of the species lately discovered in the mountain districts of the interior of China, where Delavay, the French Jesuit missionary, discovered it in marshy ground near Tali, in Yunnan. More recently, General Sir H. Collett has found the same plant in great abundance on the hills of the Shan States in eastern Burmah, growing at an elevation of three thousand feet from the sea. *P. Forbesii* is a delicate species, with small, long-stalked, ovate-cordate, irregularly lobed leaves, and small, long-stemmed, rose-colored flowers arranged in remote whorls.

A charming colored plate of *Acacia dealbata* gives special interest and distinction to the first number of the forty-second volume of *The Garden*, issued on the 2d of July. This is the Silver Wattle of eastern Australia, and one of the most beautiful trees brought from Australia. It is now a well-known plant in all semi-tropical countries, forming, where the soil suits it, handsome specimens fifty to one hundred feet high, and in spring flowering most abundantly. It is largely grown in southern France, especially in the neighborhood of Cannes, and a considerable industry is founded on the sale of its fragrant flowers, which are shipped to the Paris and London markets in large quantities. In California, too, it has been largely planted, and is one of the best Australian plants which have as yet been tried in that state, although apparently capricious about soil and location. At Cannes, for example, it is perfectly at home, while at Nice, a few miles distant, and in several other towns on the Riviera, it refuses to grow, owing, probably, to the presence of lime in the soil, which is distasteful to many Australian plants. A line a yard wide, it has been said, may be drawn between Nice and Cannes to mark the boundary of the territories in which this tree will and will not grow. In its native country it selects swamps and low ground, where it sometimes attains a height of one hundred and fifty feet.

New or Little-known Plants.

Corylopsis pauciflora.

AN account of some remarkable Japanese plants in Dr. George R. Hall's garden, in Bristol, Rhode Island, appeared three years ago (vol. ii., p. 537) in the columns of this journal. Dr. Hall was probably the first American intelligently interested in plants who lived in Japan, and he was the first to send Japanese plants to this country. He first visited Japan in 1860, and about ten years later began to plant Japanese plants in Bristol. Later he made another voyage to the east, and, returning in 1874, brought with him several plants, including a specimen of *Corylopsis pauciflora*. This (see our illustration on page 342) has now grown into the largest and most vigorous specimen that has come under our notice. The branches are six feet in height and form a compact mass of thirty-six feet in circumference.

Corylopsis belongs to the Witch Hazel family, and is chiefly valuable for the extreme precocity of the flowers, which appear in this latitude early in April, before the unfolding of the leaves; they are pale yellow and hang in short compact racemes, which quite cover the branches. Although less showy than the Forsythias and some other spring-flowering shrubs, *Corylopsis pauciflora* deserves a place in the garden, to which in early spring it adds interest and variety.

Cultural Department.

Fruit Notes.

THE Minnewaska Blackberry, I am sorry to say, must be discarded here, owing to its lack of hardiness. It is rather more tender than Kittatinny. Erie is a coarse grower and not hardy, and not certain to yield perfect berries. Agawam has a delicious flavor, and is the best home berry, with Snyder, for market—that is, in climates as cold as that of central New York. After continued experiment, my belief is, it is best to cultivate Blackberries two years, and as soon as the canes come up thickly let them fill the ground. After that I put in neither horse nor hoe. The canes must be topped and the old canes cut out. Unpleasant as handling Blackberry-bushes is, this

Cleveland as a berry not to be discarded; also in Lida, in Clara and Pearl, in Saunders, and in Parker Earle. Cumberland is still a standard for all soils and spots. Sharpless is unsurpassed on strong clay soils, but in some sections flavorless. Gypsy is an ideal for quality, but medium in size. Haverland must be retained for size and prolific bearing. Wet weather makes it soft, and it hangs over to the ground too closely. Princess I only get a taste of, but I believe in it. Yale and Williams are promising. The wonders with me are Thompson's 51 for size and length, a veritable lady-finger; a seedling of my own for double flowers, and yet large rich fruit, not prolific; Parker Earle for quantity. Those who do not care to experiment can stick to Haverland, Cumberland, Bubach and Sharpless for large fine fruit.

It is a good time to lay plans for experiments, save seeds of

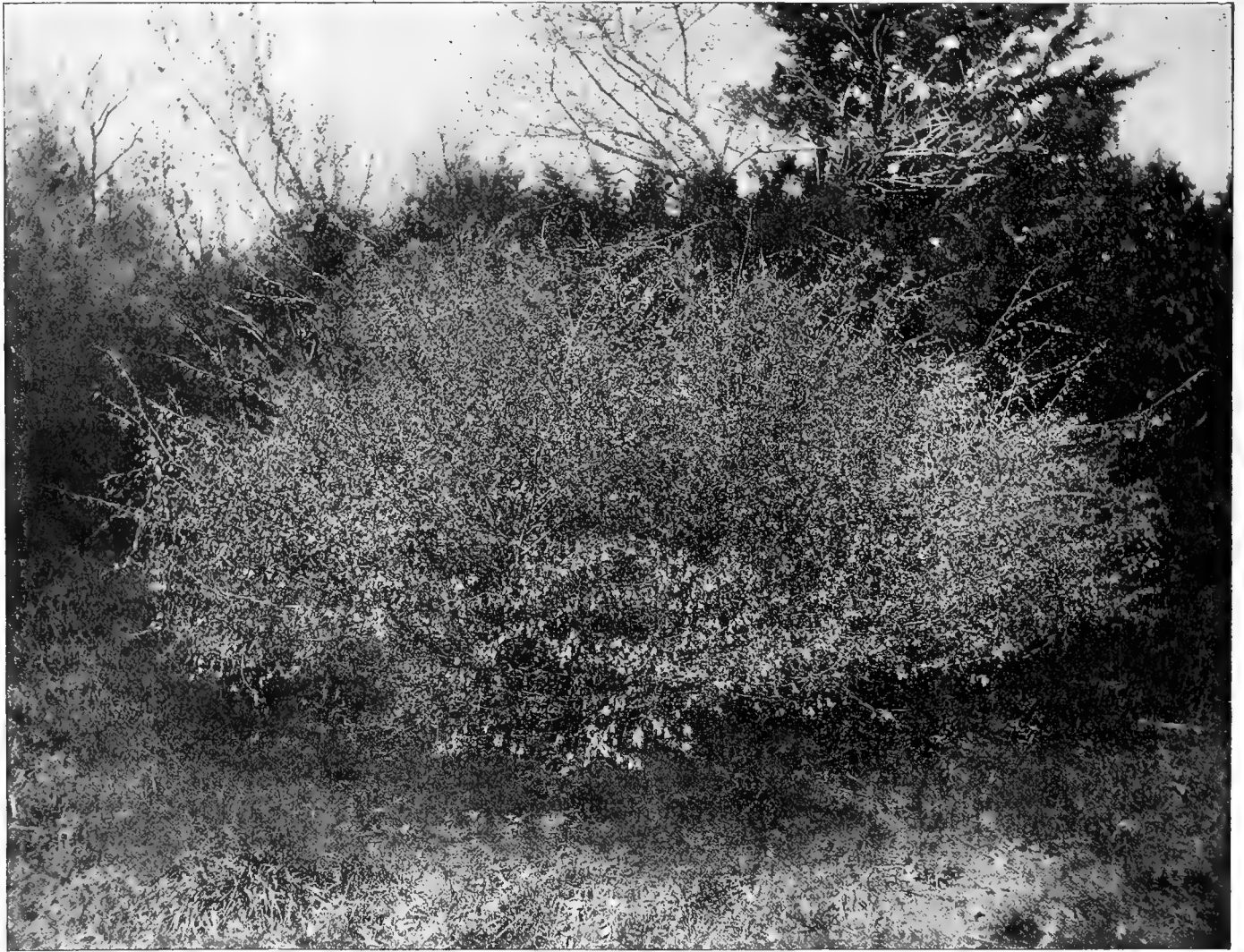


Fig. 59.—*Corylopsis pauciflora*, in Dr. Hall's garden, in Bristol, Rhode Island.—See page 341.

reduces the disagreeable job to a minimum, and gives me the largest crops.

I am inclined to modify somewhat my previous judgment of the Lucretia Dewberry. I now grow it on trellises of two wires, two feet and four feet high, and lay down the vines for the winter. This practice is almost identical with Grape-culture. They have no canes, but are true vines. The crop is magnificent for size of fruit, quantity and quality. Grown carelessly the plant is useless.

Of all Raspberries I see nothing as yet equal to the Shaffer. It always winter-kills somewhat, but it always gives fine crops of mammoth berries. But the real point is quality. This is the best berry for canning, for cooking, for jellies, for jams. The color is against it with some people. I am growing a large number of seedlings from it.

We are much in need, even yet, of thoroughly good black raspberries as large as the Gregg and absolutely hardy.

In my Strawberry-beds I renew my confidence in Mrs.

choice things and grow a few rows of seedlings. It may not pay, but Mr. Fay has made over \$25,000 as his share of Fay's Currant. You will be sure to get lots of pleasure and character from experiments.

I am in receipt of letters from Japan and from Corea about what are called Japanese Persimmons. Mr. Baird, of Fusan, Corea, says the most northern sorts will probably prove hardy here as far north as Philadelphia. I hope for better than that. Mr. Loomis, of Japan, thinks we can get seedlings that will be hardy as far north as central New York. He has sent seeds to Parsons & Co. for a full test. Dried Japanese Persimmons far surpass figs and dates. At this place I have native Persimmons from seed growing, and absolutely hardy. I have grafted successfully with best sorts grown by the best horticulturists in Virginia and Missouri. The chief trouble is in restraining cions from the south from budding out too soon, as the Persimmon is one of the latest of all trees to start growth in spring.

I recommend in all culture to use a note-book, and not rely on labels and stakes. These, with all precaution, get displaced; but your book is secure. It can also be referred to in the house at any time. It is only necessary to number your rows, and then write down in columns the names of varieties as planted.

The cost of covering Cherry-trees with mosquito-netting against birds is as follows: For fifteen trees in 1891, about \$8.00. The crop was largely used at home, but I sold \$30.00 worth. The netting will last two years. The fruit can be kept on the trees all summer.

As an all-around superb red grape for everybody's growing I recommend Gaertner. It is a rapid grower, large grape, large bunch, fine color, first-class flavor and sets admirably. Brighton must be grown with others, to pollinize it; otherwise it would stand at the head of red Grapes. Lindley is another splendid red that fails to take care of itself. Woodruff I still am sorry to condemn as too poor on my ground to be ranked among the best Grapes.

Clinton, N. Y.

E. P. Powell.

Notes on Shrubs.

IT is probable that very few people, even among those who are botanists, ever see mature fruit of the Leatherwood (*Dirca palustris*), because, although it is not so very small, it is not conspicuous, being hidden among the light green abundant foliage, and it ripens, falls, and is lost before it might be expected to have attained full growth. In this latitude, and in warm situations, the fruit ripens about the tenth of June. It is about one-third of an inch long, egg-shaped or top-shaped, and two or three are usually produced on the same stalk, which is rarely over half an inch in length, and often much shorter. The outer covering of the fruit can hardly be called fleshy, being leathery and exceedingly thin. At maturity, the fruit is of a pale whitish green color, and is so easily detached from its stalk that it is liable to fall at the slightest touch. After it does fall, or when drying for the herbarium, the outer covering of the seed turns black. If on the ground, the outer covering usually decays and falls away, and exposes the smooth shining brown, and very thin and fragile shells or seed-coverings beneath. The seed of the Leatherwood is usually produced in considerable abundance, and as it germinates very easily any number of plants are readily produced. It does not seem to be known whether or not the seed is ever taken for food by birds or the smaller quadrupeds, but in the Arboretum seedling plants are often found in most unexpected places.

Aside from its foliage and general aspect, the Leatherwood may be known at this season, from all other native shrubs, by its very soft and pliable branches and tough bark, by the base of the leaf-stalk entirely covering and concealing the brown, velvety buds which are to continue the growth next season, and by each annual growth of the branches appearing as if jointed, a characteristic which is given by the conspicuous circular leaf-scar. It will also be noticed that the last leaf or bud does not terminate the shoot at the end of the season's growth, but that there is a little budless tip, or point, which is really the apex. Except for its yellow flowers, which are among the earliest to appear in spring, the Leatherwood is of no great ornamental value from a decorative point of view.

Of all the species in the collection which are broadly included under the genus *Prunus* the earliest to ripen fruit this season proved to be the pretty flowering *P. pendula*, which had small, ripe, shining black cherries by the middle of June. They did not all mature at once, more than two weeks passing before all had changed color. The fruit was produced in much greater profusion this season than is usual here. These cherries are too minute to be of any economical value, but what there is of them has a pleasant flavor, a fact which was appreciated by the birds and chipmunks, which greedily carried them off even before they were fairly ripe. The kernel is also pleasant to the taste, which is in striking contrast to the bitter acrid-tasting kernel of our native little wild Red Cherry (*P. Pennsylvanica*), which is usually left by animals as long as there is an abundance of more palatable food. The wild Red Cherry here begins to ripen about the first week in July. Although these bright red cherries are small, being hardly larger than peas, they are a good deal larger than those of *P. pendula*. They are attractive in appearance, but the flesh is sour and not agreeable to the taste.

P. tomentosa, which came to us eight or ten years ago as seed, which was collected in the mountains about Peking, China, gives more promise of becoming a real acquisition among wild fruits of economical value. It has produced

cherries during several seasons, but never so abundantly as this, although even this year all the plants did not bear a large crop. Like most other seedlings of fruit-trees, these show much variability in quality of fruit, but on the best plants the fruit is of a pleasant though slightly acid flavor, and is over half an inch in diameter. It is round, of a clear, light red color, and is produced on stalks which are just long enough to attach the fruit to the branch, perhaps an eighth of an inch being about the average length. It is a Cherry which seems capable of much improvement by selection and cultivation, and as it is thoroughly hardy it is quite likely to obtain and keep a place in northern gardens. Professor Budd states that it is quite hardy on the grounds of the Agricultural College at Ames, Iowa. It blossoms so early, however, that although the flowers are always abundant they are so liable to be injured by frost that a good crop of fruit is not always assured. The fruit is sparsely covered with short hairs, which are so slightly noticeable that the edible quality is not affected. The flesh is firm though juicy, and the kernel is sweet and without any bitterness or suggestion of prussic acid. While the first of the cherries were ripe in the last days of June, the crop may be said to have only now (July 12th) reached perfection.

This species is interesting because so different in habit from all other Cherries in common cultivation. It may be likened to a great overgrown Currant-bush more than anything else. A number of stems spring from the root, and they appear to have about reached maturity at seven or eight feet in height, and at this time the bushes have a spread of ten or twelve feet or more. Wherever the branches rest closely upon the ground they form roots freely, and practically become independent plants. This tendency to form roots should render the propagation of any desirable superior form a matter of easy accomplishment either by layers or cuttings instead of by grafting, which in cases like this is to be avoided whenever possible. This little Cherry may prove to be a good stock upon which to graft other Cherries when a good stock is wanted for dwarfing purposes.

P. Grayana, a northern Asiatic species, which the eminent Russian botanist, Maximowicz, named in honor of the late Dr. Gray, has borne a few ripe fruits this season, undoubtedly for the first time in America. It closely resembles the Bird Cherry (*P. Padus*) of Europe, and has flowers and fruit in long racemes, the fruit being black and smaller than the cherries of our common Choke-cherry (*P. Virginiana*), and with a much less agreeable flavor—in fact, it might be counted decidedly puckery and disagreeable.

A peculiarity of *P. Grayana*, as also of *P. Padus*, is the extreme earliness of the foliage, the plants being covered with well-developed light green leaves, which render them conspicuous before the middle of April and before the leaves of other trees and shrubs have made much headway. The earliness of the foliage may be considered the chief ornamental value of these trees in this country. Unfortunately, also, they appear to be extremely subject to attacks by the black-knot fungus.

Arnold Arboretum.

J. G. Jack.

Cyclamens and Chinese Primroses.

THE well-known varieties of *Cyclamen Persicum* and *Primula Sinensis* are among the most useful dwarf-growing plants for conservatory and house decoration during the winter and spring, since their profusion of flowers is most welcome at that season. Of course, it is now too late to sow seeds of *Cyclamen* for the coming season's flowers, but about September will be a good time to make such preparation for the following year, for it is far more satisfactory to raise a crop of seedlings each season than to keep over old plants, which will not produce such fine flowers under ordinary cultivation as the young seedlings. The seeds should be fresh, as they lose vitality quite rapidly. The safest method is to sow them in pots or pans of light soil as soon as they are ripe. The pots should be shaded from the sun and placed in a temperature of fifty-five to sixty degrees. As the seedlings appear they should be given plenty of light to induce a sturdy habit, but they should be protected against strong sunshine. As soon as they have two or three leaves they may be transplanted into two-inch pots, light loam being a suitable soil for this purpose, to which may be added some sand or brick-dust to make the mixture more porous. When the young plants are nicely rooted, and before they become badly pot-bound, they should be shifted on into three-inch pots, and from these into four and six inch sizes as they require it. The plants do not like to have the soil very firm about the roots, and therefore light potting should be the rule at all times, and this is one secret of success in their

cultivation. Manure may be used in the compost in reasonable quantities, but should be old and thoroughly rotted. During the summer months *Cyclamens* can be well grown in a frame outdoors, giving plenty of fresh air at all times, but keeping sash over the plants to protect them from heavy rains and strong sunlight. As soon as the nights become cool, however, the plants will be benefited by bringing them into the greenhouse. Under this treatment strong-blooming plants are produced in fifteen to eighteen months from the seed. As green-fly is a prevalent pest of *Cyclamens*, fumigating may be necessary occasionally, but otherwise the plants are not specially subject to the attacks of insects.

In the matter of varieties it is probably best to secure some seeds of a good strain from some reliable seedsman for a beginning, and then, by careful selection and crossing, the strain may be still further improved by the grower.

The Chinese Primrose now presents a wonderful variety of forms, as the result of many years' careful selection and fertilization by various specialists, and the colors range from white through the various shades of purple to almost a blue, and from pale pink to scarlet and crimson. The single varieties are readily procured from seeds, while those with double flowers must be perpetuated by means of cuttings and division, and among the latter the double white form should not be forgotten, for it is of neat habit and extremely prolific in flowers, the latter lasting very well when cut.

The Primulas, in general, are a shade-loving class of plants, and *P. Sinensis* is no exception to the rule, but in regard to soil they are perhaps less exacting than their relatives the *Cyclamens*, and almost any light, sandy soil will produce fair results. In general treatment a similar plan may be followed to that outlined for *Cyclamens*, but it should be remembered that the Primulas do not require much water over the foliage, though an abundance at the root when in active growth, and, as the flowering period approaches, some weak liquid-manure will be found beneficial.

Holmesburg, Pa.

W. H. Taplin.

Perennial Larkspurs.

AFTER a long waiting and vexatious experiences with seed, *Delphinium Zalil* is now in flower in the garden, where it was planted in the spring of last year. This novelty is one of Dr. Aitchison's discoveries in Afghanistan, and when first described as a lemon-yellow Larkspur hardy-plant lovers were all asking for it, but as it was distributed by means of seeds, and these germinate only when fresh-gathered, many were the disappointments. Our own plants are from fresh seeds kindly sent me by Herr Max Leichtlin in the fall of 1890. These germinated readily, and were wintered over in the greenhouse and set out in spring, where they grew freely for a time, and then disappeared to come up vigorously again and flower this year. I mention this as a recognized authority has described *D. Zalil* as an annual, which it certainly is not, neither could it be called a biennial, for, supposing that the plant completes its existence after flowering, of which I am not sure, even then it takes more than two seasons' growth to get it strong enough to flower. *D. Zalil* belongs to a section of *Delphiniums* which has many representatives in the United States—namely, those that spring from a fleshy root-stock and die down as soon as seed is matured to spring up again the following year. These are not well known in gardens, though some are well worthy of cultivation, such as *D. tricornis*, which is widely distributed through the southern and western states. *D. azureum* is another species of which the same may be said. The specific name of *D. Zalil* is the native name. Since a yellow die is extracted from the roots in Afghanistan, another name, *D. sulphureum*, was given the plant when first distributed, but *D. Zalil* has priority, though the synonym describes the color accurately. With us the plants are three feet high, with much-branched flower-stems, while the flowers resemble those of *D. cardinale* and *D. nudicaule* in shape. The habit of the plant is slender and the foliage very finely divided; more so than in any other known species. As a garden-plant *D. Zalil* is insignificant compared with the beautiful double forms of the garden Larkspur, and would be passed by without remark by many, still it is of much interest to those who love for other qualities than mere showiness.

While on the subject of *Delphiniums*, has any reader had experience with the Larkspur disease, or smut? It attacks the flower-spikes and completely blackens them, in some cases crippling the unopened flowers so that they never develop at all. It is getting to be a question here whether we can have Larkspurs or not. Two years ago there were infected plants in the garden that were purchased, and in this way the disease

was introduced. These were all destroyed, and a new lot raised from seed, and this year it is apparent in many plants again, and my experience teaches that next year Larkspurs will be a complete failure here. The old reliable, *D. formosum*, is as liable to it as any others of garden origin. This smut has much the same effect as that which attacks the Corn, and is probably an allied species. Certainly the disease should be investigated by some mycologist.

D. Cashmirianum is a species that is perfectly hardy and distinct from all others. It has dense panicles of large flowers, but the color is not a pleasing one, being a dull purplish blue. It is not very desirable as a garden-plant except as a single specimen. A short time ago a so-called white form was distributed, and this proves to be of a decided greenish white, and even less attractive than the typical plant.

Too much cannot be said for the Larkspurs of garden origin, especially the double varieties, and it is worth repeating, now that they are in flower, that if the double varieties are marked when in bloom, and seed saved from them, this will produce fully seventy-five per cent. of double-flowered plants. Named varieties are very short-lived, as hardy-plant dealers know, and have to be reimported often from Europe, as they cannot be raised true from seed, and, indeed, seed is but sparingly produced from double flowers, but the seedlings are usually strong enough and able to withstand the climate here where the parents fail. Larkspurs are gross feeders, and need a rich soil that never dries out, and therefore the heavier the soil the better. In a damp position they will grow six to eight feet high, with long spikes of flowers, which may be cut as soon as they fade, and another crop of flowers will come on later. Seedlings flower the first year, but do not attain full strength until the second season.

A word should, perhaps, be added with regard to *D. Przewalskianum*, now in flower for the first time here. It was sent out a year ago, and grew vigorously last summer and wintered out well, and is now about four feet high, with spikes of pale creamy white flowers that are small, and in no way attractive from a garden point of view. The foliage is ornamental, being prettily cut, of a deep green, spotted with a paler green. It is of Asiatic origin, and, like a species from Yunnan grown last year, without name, is rather disappointing.

South Lancaster, Mass.

E. O. Orpet.

[We have received specimens of the diseased *Delphiniums*, and the trouble seems to come from a mite and not from a fungus. Professor Halsted thinks that if the affected plants are wet with cold water the increase of the mite will be checked.—Ed.]

Melianthus major.—This is a half-hardy greenhouse shrub which seldom fails to attract attention. Glaucous-leaved plants seem to possess attractions for most persons, but when the foliage is beautifully cut, as in this plant, it possesses a double beauty. There is no plant in the garden of which the name is so frequently asked as this, from which I presume that it is not often grown, though it was introduced many years ago. It is useful, not only as a specimen plant in the greenhouse, but also in the open, in sub-tropical borders, where its peculiar distinctness proves very attractive. It forms a plant some four feet high, with smooth, hollow stems, leaves stem-clasping and acutely cut.

Jatropha podagrica.—A New Granada plant which seems to be better entitled to the common name of Coral-plant than the *Erythrina*, as its inflorescence bears a striking similitude to a bunch of red coral. In all respects, this plant is a curiosity of vegetation. It is euphorbiaceous and requires the cultivation usually given to that family. It grows readily from seed, and forms smooth, erect, club-like stems, quite rounded at the apex, from which spring large, smooth peltate-cordate leaves. The plant becomes dormant late in the year, and as the new leaves commence to move there is thrown up from the apex of the gouty stems a long scape topped with an irregular raceme of orange-red flowers, arranged as a spray of coral. This inflorescence continues about a month.

Geranium Henry Cox.—Some few years ago, when visiting Mr. John Thorpe's place, I happened to meet an intelligent gentleman who was devoted to fine *Pelargoniums* in general, and this variety in particular. Having become interested in his experience, I took pains to secure a plant of the variety, which proves a most interesting one with beautiful leaves, when properly grown. It belongs to the golden tricolor section, and is properly a greenhouse-plant, being a very weak grower, very dwarf and slow to increase. It seems to need

very careful cultivation, and should be kept in warmth near the glass. In such conditions it puts forth very high-colored leaves, with veins of yellow, scarlet, green and cream of the most vivid tints. The stems of the plant are white, and a well-grown specimen is a charming thing, besides being a credit to a very skillful cultivator.

Linaria cymbalaria.—The Kenilworth Ivy is not usually known as a hardy plant, but, like many others, if grown outside under proper conditions, it will live through an ordinary winter. The conditions seem to be that it shall have a sheltered place entirely free from wet. Some plants under an overhanging south wall lived over last winter, and I have several times seen this fact noted by others. If any one had an old wall to furnish with plants it would be well to try this, as it is easily established in summer, and probably if the plants were killed in a severe winter there would be seeds scattered in the recesses which would rapidly germinate and keep up the stock.

Berteroa mutabilis (*Alyssum mutabile*) is an herbaceous perennial introduced by Thorburn & Co. last year, which is just now in flower. It proves to be perfectly hardy, and forms low spreading plants one and a half feet high, many-branched, and furnished sparsely with white *Alyssum*-like flowers. The foliage is dull and not especially attractive, and from scarcity of flowers the plants have a weedy look, and do not seem a desirable addition to the garden.

Ipomœa Bronsoni, another introduction of Messrs. Thorburn & Co. of last season, is said to be a Cuban *Ipomœa*, and is a most wonderfully rapid-growing vine. A strong plant last season covered a great number of square feet of space, and it is doubtful if there is in cultivation an annual vine which makes more rapid growth. The plants are white-stemmed and gouty at the base, but the season was not long enough for the production of flowers. This is probably of little disadvantage where such a plant would be most useful, as most of the quick-growing vines are apt to produce seeds which stock the garden with plants to be weeded out.

Elizabeth, N. J.

J. N. G.

The Forest.

Our Land Office System.

A FEW weeks ago we quoted part of an interesting chapter on the Forests of Minnesota, which had been prepared by Mr. H. B. Ayres for the Nineteenth Annual Report of the Geological Survey of that state. In the same chapter Mr. Ayres makes some excellent observations on our Land Office System, which we reproduce below:

While the giving of from 300,000 to 4,000,000 feet of standing Pine to a poor pioneer seems a paternal act on the part of the Government, the actual result is putting nearly all the value of the timber into the pocket of the lumberman, to whose plant the tract may be tributary.

The settler, even when honest, can, as a rule, afford to live on a Pine claim merely long enough to comply with the homestead or preemption law, and when he sells his Pine, often gives title to the land also, when it starts upon the routine by which it is, eventually, advertised for taxes, non-productive, idle, worthless.

If we continue, as we have done, the 17,000 men now employed in reaping the great natural harvest will soon leave the country, as they have left the older lumber states; for the lumberman, under the present system of disposing of public lands, cannot think of waiting for a second growth, while he can acquire new forests of standing Pine at a nominal figure. His only sensible course, as far as his own interests are concerned, is to strip off the lumber and abandon the land.

The time to decide upon the use to which timbered lands should be put is, undoubtedly, before they pass into the hands of individuals. They should be examined, and the question decided, whether they should be thrown open for settlement as farm-lands, or whether it would be best for the general welfare to have them kept in timber.

There are still in the state some 6,000,000 acres of more or less wooded land belonging to the Federal Government. To one looking the situation fairly in the face, would it not seem best to have all this area withheld from settlement until the soil be examined, and its adaptability determined?

The direct profits that may be expected from forestry are not large after the virgin timber has been cut. In Europe, seldom over 5 per cent. is realized, and the American lumber-

man cannot be expected to act contrary to his notable common sense and shrewdness and stay and do a business that brings in 5 per cent., while he may by entering a new field, under the present land office system, get from 10 to 200 per cent. Only in exceptional cases, most favorable to growth and convenience to market, is forestry profitable to the individual. To a corporation of woodworkers the profits may be greater, but it is only the state or the General Government that will be able to reap all those other benefits, such as permanency of industries, support of greatest population, etc., which, added to the direct profits possible to the individual, would bring the sum of gains well within the percentage of fair business profits.

Forest-lands should, therefore, as a rule, be managed by the state or by the Federal Government.

In Minnesota, the federal lands now vacant, and more or less wooded, amount to some	6,000,000 acres.
The state lands	600,000
The university lands	470,000
The school lands	231,000
	1,301,000

Total public forest-lands . . . 7,301,000 acres.

The question as to what would be the best management of these lands has been studied, and studied faithfully, by many, if not by all the men upon whom their care devolved, and, no doubt, they have found the difficulties that they, single-handed, were unable to overcome. It is necessary that all the people be so well informed that they may, at least, be able to appreciate the efforts their chosen representatives in the local, state or Federal Government may make in their behalf; and while it is the plain duty of these representatives to study all the questions bearing upon the welfare of their constituent regions, these questions are so numerous that they cannot be expected to master them all, unless those who have made special study aid them by digests of their work.

Correspondence.

Plant Diseases in West Virginia.

To the Editor of GARDEN AND FOREST:

Sir,—In the southern portion of this state, especially in Mercer County, this season, the indigenous Juniper, and particularly those in yards, have much the appearance of fruiting Orange-trees, so thickly are they dotted with the large cedar-apple (*Gymnosporangium macropus*) in its fruiting stage. The orchards of this district plainly show the predominance of this fungus by the prevalence of the second stage (*Roestelia pyrata*) on the leaves of the apple. The farmers questioned state that the disease has been noticed particularly upon the Juniper-trees during the last three years. Previous to my visit, no attempt whatever had been made to cut out the cedar-apples and burn them.

The leaves of the wild Blackberries, especially those of pasture and meadow lands, are being destroyed in all sections of the state by the *Uredo*, *Cæoma luminatum*, which is so common this season that I have yet to see a field in which the briers were not more or less affected by this fungus, while many present the appearance of being covered with an orange fabric. In this state, where these briers are considered one of the worst of our weeds, the benefit of such widespread affection can be readily realized.

I have been watching with considerable interest for the appearance of *Puccinia suaveolens* among our few stations of Canada Thistles, but have so far failed to notice it. Once only have I found the disease, and then on the Boar Thistle (*Cnicus lanceolatus*); even this was so far from any known patch of Canada Thistles that I was unable to transfer the spores, much as I desired to do so. I feel confident that this would be the only true measure of eradication to practice effectively against this Thistle. I was glad to be able to prove last season that the seeds produced by Canada Thistles in this state were incapable of germination, owing to improper fertilization of the ovaries. There remains, therefore, only the root-spreading for our farmers to contend with.

In the Pine-forests of the Alleghany region great damage is being done by a beetle (*Dendroctonus frontalis*), which girdles the inner bark, thus cutting off the flow of sap. Hundreds of trees are perishing through the destructive action of this insect. In searching for some method of checking its ravages, our entomologist, Mr. A. D. Hopkins, found large numbers of the larvæ of this beetle dead and covered with a new fungus disease which Professor Peck has named *Cylindrocalla*

Dendroctoni. Detecting no other cause for the death of these larvæ, and deciding that the *Cylindrocalla* must be the agent, we have inaugurated a series of experiments to decide the question, and, if possible, to enable us to cultivate and transmit the disease. Trees affected and unaffected by the beetle in question were found to be very prominently the host of *Lophodermium Pinastris*, *Coleosporium Senecionis*, and *Hyphoderma Dezmanzieri*, but we consider none of these forms to be particularly devitalizing to the affected trees.

The Laurels are greatly affected this season by the common leaf-spot (*Septoria Kalmiaecola*); and the leaves of *Rhododendron maximum* in the dense forests of the Alleghanies are being badly deformed and the shrubs injured by great quantities of *Exobasidium Rhododendri*. We believe this to be the first report of the presence of this European species in the United States. Our Peach-trees in many localities are showing this season disastrous inroads of the Yellows, and in spite of our efforts among the farmers of the state the Black Knot of the Plum and Cherry is advancing.

Our state began botanically terra incognita, our work is becoming fruitful of new forms and exceedingly interesting in general. Many of our wild plants, economic and otherwise, are affected this year by different parasitic species of fungi, and our orchards and crops are in nowise exempt from their almost discouraging attacks.

Agr. Exp. Station.

Charles Frederick Millsbaugh.

How Cold Air Settles in Hollows.

To the Editor of GARDEN AND FOREST:

Sir,—An extreme instance of the often-observed fact that cold air settles in hollows, will bear repetition, although it occurred as long ago as the winter of 1874-75, and the facts were made public. At the time, in the Traverse Bay region, Michigan, there was considerable interest manifested by fruit-growers in the subject of the proper location for orchards, and the highest elevations were considered the safest.

Mr. Isaac Garthe, living near Northport, Leelenaw County, arising before daylight on the 10th of January, 1875, was surprised to find his thermometer indicating thirty-six degrees below zero. He at once started for the house of his next neighbor, Mr. Theodore Parmelee, whose house is 150 or 200 feet higher, and on the way noticed the steady rise in temperature, which at his destination was up to sixteen degrees. After some minutes of conversation he returned home, and when he got there, still before daylight, the thermometer had fallen back to thirty-six degrees.

Mr. Garthe's house was in a hollow surrounded by hills, and it is hardly necessary to mention that the air was still. As sixteen degrees is about an extreme temperature for that region, this great difference of twenty degrees is rather noteworthy.

Milwaukee, Wis.

C. L. Mann.

The Rose Hill Nurseries.

To the Editor of GARDEN AND FOREST:

Sir,—This establishment is located at New Rochelle, New York, and has a wide fame for fine plants which have long been specialties here. Messrs. Siebrecht & Wadley have a reputation in New York City and Newport as leading florists and decorators, and also for their enterprise and activity in giving many flower-shows both in the Eden Musée and Madison Square Garden. The nurseries are probably the natural result of a long-continued successful city business with its demand for high-class flowers and plants, but there has been a branching out in other lines, so that an extensive list of plants is now grown here. A study of their beautifully printed and comprehensive catalogue led me the other day to New Rochelle, a section of Westchester County, where all the available lands seem to be undergoing a rapid transformation into syndicated parks. To the Rose Hill Nurseries is a short drive over a pleasant road, along which, on a quiet bit of road-side, I was surprised to find a rather imposing marble monument to Thomas Paine. How many people in this city know that the author of "The Rights of Man" has been honored in this way?

The entrance to the nursery is at present an excellent example of bold and careful planting. A long curving line of shrubs, hardy perennials, *Retinosporas* and other conifers, and bold grasses, backed by a Privet-hedge, shut out of view the main plantations, while groups and lines of bold plants at the left mask the base of Mr. H. Siebrecht's residence and partly hide the buildings in the rear. A noble group of *Rhododendrons*, at the extreme left, break the continuity of the screen. A border of this character, not overcrowded, is always

interesting, and not nearly so expensive to maintain as a border of ordinary bedding plants. Hardy plants are largely grown, several acres being devoted to their cultivation. I noticed not only a large selection of the popular hardy perennial plants, but also many gems in the way of terrestrial Orchids. There were also plantations of young Roses, others of *Rhododendrons*, Azaleas, Lilacs for forcing, while, as anti-climaxes, there were tanks of aquatics and borders of Cacti.

While the exigencies of nurseries require that they shall be located where land is comparatively cheap and the air is pure, it will usually be noticed that the florist generally locates in pleasant quarters where there is a good outlook. The Rose Hill Nurseries make no exception to this rule. The extensive ranges of houses occupy the ridge of a low hill from which there is a pleasant view over the surrounding country. In these ranges, mostly practical working houses, was found an extensive stock of plants. Messrs. Siebrecht & Wadley are large operators in Palms, which in these days are in such rapidly increasing demand for house decoration. Not only are Palms grown largely on the premises, but a branch nursery is maintained at Dabadie, Trinidad, West Indies, to which young plants are sent to be grown in the open to salable sizes. The traffic back and forth of Palms, Crotons, Marantas and various large-growing tropical plants is sufficiently extensive to enable Messrs. Siebrecht & Wadley to permanently engage a special compartment in the regular steamers for this purpose. The demand for Palms is evidently unending, for, not considering the Trinidad stock, here were to be seen Palms not only in special houses, but also in all available spaces, while extensive ranges of high frames were filled with small potted Palms, plunged in spent tan and kept close in the process of forcing. Among the showiest plants in the Palm-houses were some large specimen Crotons from Trinidad, in which climate they form small trees of brilliant foliage. Orchids are also a great specialty, a very extensive variety being grown. While numerous rare plants are often in stock, very large numbers of the useful Orchids are grown for cut flowers, it being necessary in the retail business to have always at command a constant supply. The flowers seem to be kept cut rather closely, only a few flowers of *Cattleya Gigas* being open during my visit. A rather novel sight was one house the entire half of which was occupied by a bed of *Odontoglossum crispum* planted out. These were on a sloping bed with a slatted bottom. Under this a bench was filled with clinkers to retain moisture. A Rose-house or two, one of *Chrysanthemums* and several of select Ferns were interesting.

The demand for Tuberous Begonias has found Messrs. Siebrecht & Wadley prepared with a strain in which they take great pride. The plants in flower in one of the houses were single and double, and excellent examples of this favorite flower. In the same house were some *Gloxinias* of an excellent upright flowering habit and most glowing colors, evidently a first-rate strain. Aside from these, the most brilliant mass of color in the houses was a collection of fancy *Caladiums*, which at this season are in their glory.

Such establishments as the Rose Hill Nurseries prove the existence of more active purchasers of good plants than we are apt to think are among us, but it would seem to require an exhibition building to house some dormant Tree Ferns some fifteen and eighteen feet high, a number of which I noticed as just arriving.

Mr. Siebrecht is ably seconded in the management by his two sons, and it is a pleasure to note the air of prosperity and organization evidently prevailing at Rose Hill.

New York.

G.

Recent Publications.

The Silva of North America: A Description of the Trees which grow naturally in North America, exclusive of Mexico. By Charles Sprague Sargent. Illustrated with figures and analyses drawn from nature by Charles Edward Faxon, and engraved by Philibert and Eugène Picart. Vol. IV. Rosaceæ-Saxifragaceæ. Large quarto; pages 141; plates fifty. Houghton, Mifflin & Co., Boston and New York.

The fourth volume of this great work upon the trees of North America sustains the noble character of the preceding volumes, and adds another monument to the literature of American descriptive botany. The present volume will undoubtedly prove to be the most important of the series in a horticultural sense, for it discusses the Rose family, being largely occupied with the native Plums, Cherries, Apples and Hawthorns. The only other volumes which can approach it in horticultural importance are the forthcoming one devoted to the conifers and the one already published which describes

the Magnolias. Of the forty-one species described in Vol. IV. thirty-two are already in cultivation for fruit or ornament, and all the remaining nine are worthy of introduction. The volume also possesses unusual interest for botanists from the fact that it illustrates so many species bearing fleshy fruits, parts which are not preserved in the ordinary herbarium.

The greater number of the species fall into three genera—*Prunus*, with fourteen species; *Cratægus*, with the same number, and *Pyrus*, with five species. Other genera are *Chrysobalanus* (the Cocoa Plum), *Vanquelinia*, *Cercocarpus*, *Heteromeles*, *Amelanchier* and the single arborescent saxifrageous genus *Lyonothamnus*.

The most striking feature of this fourth volume is the portrayal of the native Plums, which have never before been so well presented, and which are now attracting great attention as the sources of a new class of fruits. Five species are now recognized in the eastern states where a few years ago there were but two. Four of these are the parents of important cultivated varieties, and all of them possess merits as ornamental plants. The one species whose fruit has not yet been ameliorated is *Prunus Alleghaniensis*, a slender small tree, which "is not known to grow spontaneously outside of a small elevated region in central Pennsylvania." This species was first described by Professor T. C. Porter in 1877. It is not known to cultivation except in a few collections connected with public institutions. As grown at Ithaca, New York, it is very showy when in bloom, and its foliage is attractive; and Professor Sargent says that the fruit is collected in large quantities in its native localities for making jellies, jams and preserves. We shall hope to soon see it generally distributed in the gardens.

The remaining north-eastern Plums are *Prunus nigra*, *P. Americana*, *P. hortulana* and *P. angustifolia*. *P. nigra*, the Red or Canada Plum, has not been recognized in our modern books, although it was described something like a century ago. Professor Sargent uses the name to designate a large-fruited, flat-stoned Plum, with glandular-serrate calyx lobes and glandular leaf-stalks, which ranges through the St. Lawrence valley, and westward to the Assiniboine region. Its flowers are earlier and larger than those of *P. Americana*, with which it has been formerly united; and it is thought to have been commoner in cultivation in former years than the other species. It is now said to be naturalized about houses and highways in some of the northernmost eastern states. To this species, Professor Sargent would refer the Purple Yosemite, Quaker and Weaver Plums. The separation of *P. nigra* from the older species, *P. Americana*, will excite a closer study of our northern wild Plums, although there may still be some doubt as to its true specific position. The separation of this species takes the true *P. Americana* from Canadian territory, and makes its northernmost limit, in the east, central New York and northern New Jersey. It ranges westward to Montana and Colorado, and southward to Florida and Mexico. The orchard varieties known as De Soto, Itaska, Forest Garden, Louise, Minnetonka, Cheney, Deep Creek and Kickapoo are referred to this species; and so are Forest Rose and Miner, but this is evidently an inadvertence, as they are also referred to *P. hortulana*, to which they probably belong.

The greatest innovation among the Plums is the recognition of a newly described species, *P. hortulana*, standing between *P. Americana* and the true Chickasaws. This species grows wild in the Mississippi valley, from northern Illinois to Tennessee and Arkansas, ranging southwestward through Texas. It is a smooth-growing, mostly upright, small tree, with ovate-lanceolate, mostly shining, closely serrate leaves, and reddish or yellow fruit, and a small roughish clinging stone. Horticulturally, it is probably the most important of the wild Plums, having given to cultivation the Wild Goose, Wayland and Miner, the three best-known native varieties; it is also considered to be the parent of Cumberland, Indian Chief, Garfield, Sucker City (evidently an error for Sucker State), Missouri Apricot, Indiana Red, Golden Beauty, Forest Rose and Parsons. It also appears to hybridize with the Peach, as in the so-called Blackman Plum, but these hybrids are sterile. The fruit, as represented in the plate, is rather undersized, and it lacks a peculiar dotted character which is common to most, if not all, the forms of this species.

The Chickasaw Plum, for which Marshall's name, *P. angustifolia*, is now used, is considered to have given to our orchards such varieties as Pottawatamie, Jennie Lucas, Early Red, Caddo Chief, Transparent and Colleta. It is essentially southern in its range, although it occurs as far north as Delaware and Kentucky. It is thought that this Plum has been introduced into the eastern states, if not into the United States as a whole; but this point, probably, needs close investigation. A peculiar character of the fresh fruit of this species

is the dotted surface, a feature which does not appear in the plate.

Among the Cherries, botanists will miss *Prunus demissa* of the west, which Professor Sargent considers inseparable from the Choke Cherry (*P. Virginiana*).

In wild Apples, the reader will find a variety (*Iceensis*) of the common Crab (*Pyrus coronaria*). This variety, which has been thought to deserve specific rank, is the common Crab of the Mississippi Valley. One of its distinguishing characters is the short and thick fruit-stem, as compared with *P. coronaria* proper, and which is not well indicated in the plate. *P. angustifolia* and *P. rivularis* are figured and described, as are also the two Mountain Ashes (*P. Americana* and *P. sambucifolia*).

Next to the Plums, the Hawthorns are the most striking feature of the volume. The magnificent plates will greatly aid in elucidating one of the most confused genera in our flora. Fourteen species are recognized, but there are few changes in nomenclature. *Cratægus uniflora*, of Muenchausen, replaces the familiar *C. parvifolia* of our manuals; *C. coccinea*, var. *mollis*, is erected to specific rank under the name of *C. mollis*; *C. rivularis*, of Nuttall, becomes a variety of *C. Douglasii*; *C. berberifolia* is a variety of *C. Crus-Galli*; and *C. elliptica* is reduced to a variety of *C. flava*. It is to be hoped that these plates will direct attention anew to the value of our native Thorns as ornamental plants. The plates are all so excellent that it is impossible to select any one of them for particular comment, but every botanist must at once appreciate the aid which the illustration of *C. punctata* will render in elucidating a handsome species which has been too long overlooked or neglected.

The Juneberry, or Service-berry, which is now coming into cultivation, appears as *Amelanchier Canadensis*, var. *obovalis*, instead of as var. *oblongifolia*, as heretofore. Another variety of *A. Canadensis* is recognized in var. *spicata*, which is the *A. ovalis* of botanists (but not of recent horticulturists). This variety is characterized by "broader obovate, sometimes suborbicular, leaves," and "is common in the northern states." The western Service-berry is kept distinct from the eastern species as *A. alnifolia*.

Aside from the inestimable value of the running text and the plates, the foot-notes abound in historical matter, and those concerning the cultivated Plums, Cherries, Apricots, Peaches and Apples are among the best concise statements concerning the origins and botanical features of these fruits which have been published.

This volume of the *Silva* is appropriately dedicated "to Horatio Hollis Hunnewell, a true lover of trees and a wise and generous patron of the arts and sciences."

Cornell University.

L. H. Bailey.

Notes.

One hundred and twenty years ago the ground upon which stands the Lutheran church at Mannheim, Pennsylvania, was donated to the congregation by Baron Henry William Seigel, who had founded the town, upon consideration of the annual payment of one red rose. This pretty rent was twice demanded and paid before the death of the baron.

Our native Spiked Loosestrife (*Lythrum Salicaria*) is a most effective plant for the borders of artificial water or in damp places, where its purple-lilac flowers, borne on spikes from four to six feet high, show well against masses of foliage. It is one of those sturdy plants which will take care of themselves when once established, and it has the advantage of keeping in flower for a long time.

Americans are often called an unsentimental people, but, in fact, their sentimentality constantly reveals itself in ways which must seem surprising to foreigners. For example, not content with making a simple exhibit of their famous Blue-grass at the Chicago Exhibition, the Kentucky committee proposes to collect the sods from historic spots, as from the home of Henry Clay, the birthplace of Lincoln, and the battle-field of Perryville.

The Edelweiss, one of the most beautiful and quaint of mountain flowers, is doomed to extinction, says the *Cornhill Magazine*, because tourists in Switzerland consider themselves bound by fashion to wear a couple of dried specimens in their hats and send them home gummed to a card. We are glad that the government in one or two of the cantons has interfered to save the persecuted plant, and has made it a finable offense to pluck its flowers.

In Japan, writes Mr. Lafcadio Hearn, "stones are valued for their beauty, and large stones, selected for their shape, may have an æsthetic worth of hundreds of dollars. And

large stones form the skeleton or frame-work in the design of old Japanese gardens. Not only is every stone chosen with a view to its particular expressiveness of form, but every stone in the garden or about the premises has its separate and individual name, indicating its purpose or its decorative duty."

The weekly exhibition at Horticultural Hall, in Boston, on Saturday, was not large, but the fruits and vegetables displayed were unusually fine. The spikes of double Hollyhocks shown by J. S. Fay and N. T. Kidder were of the best quality, and some of the newer Sweet Peas were very interesting, on account of their delicate colors. The herbaceous plants sent by Rea Brothers and the wild flowers collected by Mrs. P. D. Richards added much to the interest of the exhibition.

Some of the Bush Honeysuckles make a beautiful display at this season with their bright-colored fruit. The old Tartarean Honeysuckle is one of the very best of shrubs for the north, as it will endure the severest winters. It has an admirable habit, flowers abundantly, and its different varieties bear crimson or yellow berries, which have now ripened to their richest coloring. *Lonicera Morowii*, from Japan, is fairly loaded with bright red fruit clustered among leaves of light green, while the branches of *L. Ruprechtiana* bend under the weight of its berries of the same color, although covered with a slight bloom. This last shrub comes from Manchuria. The beautiful fruit of all these Honeysuckles, coming at a season when flowers in the shrubbery are rare, gives them especial value.

The preference which English buyers show for foreign-grown apples is not very encouraging for this industry in England. The growers wish to have their apples protected by imposing an import duty upon the foreign-grown product. One journal answers this by saying that it would be hard to force housekeepers to make their puddings with apples which are high-priced but of inferior quality. At a recent banquet of the British Fruit Growers the proposition was made that all apples exposed for sale be marked "Foreign" or "English." This proposition was enthusiastically received. In this manner English protectionists will not be obliged to buy apples which have the misfortune of having been grown under a foreign sun. In spite of English opposition to foreign-grown fruit the papers continue to announce the arrival of successive shipments, all of which sell rapidly. It is estimated that about 240,000 bushels arrived during the spring months, all coming from Tasmania. Six weeks are required for transportation.

In his description of a trip down the Danube, Mr. Frank Millet says, in the July number of *Harper's Magazine*, that at Hirsova, near the Russo-Bulgarian frontier, the river "divides into a number of branches which enclose and intersect with sinuous windings a great irregular marsh twelve or fifteen miles in width. The shortest of the sluggish branches of the river skirts the eastern limits of the Roumanian plain, and paddling into this narrow channel we found ourselves in a short half-hour in a region quite unlike any we had yet seen. Both banks are low and covered with tall Reeds alternating with Willow-patches. The only habitations are little fishing-stations, and these are miles apart. The fishermen's dwellings are hovels of the rudest kind, built of mud, thatched with reeds, and surrounded by fences of the same material. The botanist whose duty it was to gather drift-wood brought back from his rambles a great bouquet of wild flowers—*Melilot*, *Loosestrife*, *Convolvulus*, *Blue Veronica*, *Chicory*, *Tamarisk*, *Snapdragon* and many others."

A correspondent, in speaking of our commendation of the Prairie Rose (*Rosa setigera*), writes that he has examined all the nursery catalogues he can find, and no one seems to have this plant on sale. We see no reason why this plant, which is one of the handsomest of all single Roses, should be neglected by commercial growers, especially since it has the advantage of flowering as late as almost any other single-flowered Rose except the *R. foliolosa* from Texas. We recently saw it in a southern city trained over the veranda of a cottage, where it made a more beautiful display than any of the double-flowered Roses growing on the neighboring houses. This is one good way to use the Prairie Rose, although it probably looks best when planted at the top of a bank and is allowed to send down its long, vigorous and graceful shoots irregularly to the bottom. It is a good subject to plant as a single specimen on the margin of a lawn. If it is set in good soil and with sufficient room its arching stems will form a mass of foliage ten or twelve feet in diameter. It has been in bloom now for three weeks, and its large clusters of pink flowers show admirably against the pale blue-green foliage.

Mr. James MacPherson writes to *The Country Gentleman* of some fine trees at the old Moon Nursery, at Morrisville, Pennsylvania, which was established about fifty years ago. A Pin Oak, which was planted some forty years ago by the father of the present Mr. Samuel Moon, now girths eight feet and ten inches four feet from the ground. A Bur Oak at the same height, and thirty years old, has a circumference of seven feet, and the Willow Oaks show as strong a growth. A Purple Beech, thirty-five years old, girths eight feet and nine inches three feet above the ground, and another specimen, only twenty-five years old, is forty feet high and six feet in girth. The Japanese Red Bud seems to have reached its maximum development here, one specimen being fourteen feet high and twenty-one feet in diameter, while *Exochorda grandiflora* is about the same size. These figures show that it ought not to be a discouraging thing to plant trees, and, as Mr. MacPherson well remarks, a young man who begins to plant when he gets married may have trees to be proud of before his children leave him.

The Sierra Club, recently incorporated in San Francisco, is a corporation formed to explore, enjoy and render accessible the mountain-regions of the Pacific coast; to publish authentic information concerning them; to enlist the support and co-operation of the people and the Government in preserving the forests and other natural features of the Sierra Nevada Mountains; to take, acquire, purchase, hold, sell and convey real and personal property, and to mortgage or pledge the same for the purpose of securing any indebtedness which the corporation may incur; to make contracts and transact other business pertaining to the corporation and the management of its property. John Muir is President, and Warren Olney is the First Vice-President of the club. Applications for membership may be addressed to the Secretary, William D. Armes, University of California, Berkeley, California, the admission fee being \$5.00, while the annual dues, except for undergraduates of colleges and members residing beyond certain counties in the neighborhood of San Francisco (which is placed at \$1.00), is \$5.00.

In an article entitled "Pestiferous Plants," in the *Popular Science Monthly*, Professor B. D. Halsted says: "The fact is patent that weeds are everywhere present, and the best means ought to be taken to resist their greater prevalence. In this warfare against them there is no weapon equal to a thorough knowledge of the enemy—that is, an understanding of their nature, their appearance in all stages of growth, their methods of propagation and dissemination of the seeds. This knowledge is much more highly appreciated in Europe than here. In Germany, for example, they have wall-maps upon which the leading weeds are represented. Hung as these are upon the school-room walls, a child, simply from daily seeing these life-like colored drawings of the various pests, will learn their appearance and names. Some such method of instruction is needed in this country, by which the children who are soon to be our farmers and gardeners may become familiar with the troublesome weeds even in advance of their advent, that the proper means may be taken at once for meeting and destroying them. Editors of agricultural papers and professors in agricultural colleges yearly receive many letters asking for the simplest kind of information concerning many common weeds, thus showing the general lack of knowledge upon this important subject. To put a map of a dozen of the most destructive weeds upon the walls of every country school-house in the United States is a great undertaking; but, if it were done, the next and succeeding generations of farmers would be the better able to carry on the work of extermination. There are a large number of farmers' clubs throughout the country, and a great deal might be done by hanging a weed-chart upon the walls of these halls, where farmers gather from time to time for mutual improvement and a better understanding of the ways and means of a more profitable agriculture. Weeds have been neglected in more ways than one, and just so far as they are overlooked and left to themselves the greater will be the curse. As we look over the premium-lists of our thousands of county and state fairs we seldom see a prize offered for the best collection of weeds. It seems incompatible with our fitness of things to have a good collection of anything that is bad; and yet the fact remains that there is no class of plants about which an increase of knowledge is more imperative than these same ugly weeds. A few dollars expended in awards by each fair association would bring together lists of plant pests, the exhibition of which would not only surprise but greatly instruct those who see them. It is not less important for the farmers of any district to know of the arrival of a new weed than of the advent of a new fruit or grain."

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLES:—Umbellularia. (With figure.).....	349
Surplus Trees in Central Park.....	350
Cutting of Trees in the Yosemite Valley.....	350
Max Leichtlin.....	350
Cultivating the Almond in California.....	Henry J. Philpott. 351
Wild Flowers in Italy.....	Louise Dodge. 351
A Bed of Hardy Perennials.....	Mrs. Danske Dandridge. 352
CULTURAL DEPARTMENT:—Blights of Variegated Pelargoniums,	
Professor Byron D. Halsted.....	353
Notes on Shrubs.....	J. G. Jack. 353
The Water Garden.....	W. T. 354
Alstroemeria aurantiaca.....	R. Cameron. 354
The Harebells.....	T. D. H. 355
Abortive Strawberries.....	E. G. Ledeman. 355
Galium aristatum.....	S. 356
Sobralias.....	Gardeners' Magazine. 356
THE FOREST:—The Forest as Modified by Human Agency.—I.....	Colonel Bailey. 356
CORRESPONDENCE:—Vernon Park, Philadelphia.....	Thomas Meehan. 357
Gardens in Northern Germany.....	Wilhelmine Seliger. 358
Wintering Half-hardy Plants.....	Joseph Meehan. 358
RECENT PUBLICATIONS.....	358
NOTES.....	360
ILLUSTRATIONS:—Blighted Leaves of Pelargoniums.....	353
The California Locust (Umbellularia Californica), Fig. 60.....	355

Umbellularia.

OF the Laurel family some fifty genera and nine hundred species are distinguished. These are chiefly tropical, and are American, Asiatic, Australian and Polynesian. A few species are found outside the tropics in southern Europe, the Canary Islands, south Africa, New Zealand, and North and South America. The species are mostly woody, and are distinguished by minutely punctate alternate simple leaves with entire margins. The flowers, which are always minute and are perfect or dioecious, are usually arranged in umbellate clusters or cymes, the perianth, which is generally white or yellow, being composed of four or six sepals; there are no petals, numerous stamens in three or four rows, the anthers opening by one or two uplifted valves, and a single style and stigma. The fruit is fleshy and berry-like, or rarely drupaceous or sometimes dry, and is always indehiscent. The plants of this family secrete in the bark and in the glands of the leaves and flowers a pungent volatile oil which has stimulating or sedative properties. To it is due their chief value to man, although many of the species produce timber of great strength and value, and *Persea gratissima*, a native of South America, yields a large, succulent fruit—the avarcado or alligator pear—for which this tree is cultivated in all tropical countries. To this family belong the Cinnamon-trees cultivated in the tropics for their fragrant hot, sugary bark, and the Camphor-tree, a native of China and Japan, cultivated in the far east for the colorless volatile fragrant acrid oil, the camphor of commerce, which is distilled from the wood. To this family belongs, too, the Laurel of southern Europe (*Laurus nobilis*), one of the plants called *Daphne* by the ancients, the reward of the victor, and still the best ornament of the gardens of southern Europe. A tree of the Laurel family (*Nectandra Rodiæri*), a native of Demarara, produces greenheart, one

of the most valuable tropical woods known to the cabinet-maker; the Brazilian *Licaria Guayanensis* yields pepper-wood, so called from the pungent character of the dust made in working it; and *Persea Indica*, the so-called Madeira mahogany of commerce.

With the exception of Japan, temperate North America is probably richer in species of Lauraceæ than other extra-tropical regions. In the eastern United States five genera are represented by seven species. The best known of these is the Sassafras, one of the most beautiful trees of our eastern forests, which it inhabits from New England to Texas. No tree is so often mentioned as the Sassafras in the annals of the early travelers in America, who imagined it one of those spice trees of the east which fired the imagination of Europe in the fifteenth and sixteenth centuries; and many expeditions were fitted out for the purpose of gathering the bark and roots of this tree. The family is represented, too, in eastern America, by the Red Bay (*Persea Carolinensis*), a handsome, small tree of the maritime region of the southern states, well known for its beautiful, bright red heart-wood; by the Lance-wood (*Nectandra Willdenoviana*), a tropical American species found also on the coast and islands of southern Florida; by the familiar Spice Bushes (*Lindera* and *Litsea*), and by the curious leafless parasitic climbing *Cassyta* of southern Florida. In the forests of Pacific North America, Lauraceæ is represented by a single species, *Umbellularia Californica*, the noblest member of the family in North America, and one of the most beautiful evergreen trees of the north temperate zone.

The genus *Umbellularia*, established by Nuttall and still only represented by the California Laurel, is distinguished by its perfect flowers, borne in stalked terminal and ultimately axillary umbels, which are included before expansion in involucre composed of four broad deciduous bracts; by a six-parted deciduous calyx, nine stamens inserted in three rows, those of the inner row being furnished with a fleshy gland on each side of the base, alternating with three staminodia, four-celled anthers, a dilated stigma, and a dark purple sub-globose drupe an inch in length, and surrounded at the base by the thickened remnants of the calyx. The leaves, which are lanceolate-oblong, are sometimes four inches in length, and are dark yellow-green and very lustrous; they are delightfully fragrant, although exceedingly acrid, and give off when bruised a pungent effluvia which excites sneezing. The California Laurel has been referred by botanists to a number of different genera, and to the people of California it is known also as Mountain Laurel, Spice-tree, Cajiput, California Olive and California Bay-tree.

Umbellularia is common in all the coast-region from southern Oregon to the southern borders of California, and it is not rare on the western slopes of the Sierra Nevada Mountains. In the valleys of Oregon and northern California, in rich soil and in the neighborhood of streams, the California Laurel is most abundant and grows to its greatest size, rising sometimes to the height of a hundred feet and making tall stout stems five or six feet in diameter. At the north it sometimes forms forests, either growing by itself or in company with the great Oregon Maple (*Acer macrophyllum*). In central and southern California, especially when it grows beyond the coast-region, the California Laurel is a smaller and often a bushy tree, which only in old age assumes the spreading habit and forms the graceful head peculiar to fine specimens of this species.

The value of the California Laurel as an ornamental tree is very great; the forests of Pacific North America do not contain another tree better suited to adorn the parks and gardens of that state, and certainly the most beautiful gardens in California are those in which single specimens or groups of this tree were left when the indigenous growth was originally cleared away. A view made of such a garden by our obliging correspondent, Mr. F. Gallaher, of San Francisco, appears in the illustration on page 355 of this issue, in which may be seen a plant of *Umbellularia* with

the habit which it assumes when it has grown in the open ground and the development of the lower branches has not been interfered with, and which is quite different from the stately, long massive-stemmed habit it assumes in the dense forests of southern Oregon.

As a timber-tree *Umbellularia* is extremely valuable. No other Pacific-coast tree produces such valuable timber for the cabinet-maker and joiner. The wood is rich light brown, heavy, hard, very strong, and close-grained, the satiny surface, often marked by contorted and twisted grain, being susceptible of receiving a beautiful polish. It has been much used in California for furniture and the interior finish of dwellings, and in Oregon for the cross-trees, cleats, bits and jaws of ships and boats.

It would be interesting to know if this tree, which was transported many years ago into the gardens of Europe, has succeeded in establishing itself anywhere beyond the region of its home. It might be expected to flourish in southern Europe, and to surpass the true Laurel there in size and beauty; in some parts of India and Australia, and in southern Japan, we should expect also to find *Umbellularia* growing into a stately and beautiful tree, although it is in California, no doubt, that it is destined to play its most important part as an ornamental and as a timber tree.

A CRITICAL examination of several parts of the Central Park in this city shows that the ten thousand trees which the managers claim that they have removed during the last three years are not missed, and that their removal has left no unsightly gaps. Indeed, the park is still so overcrowded with trees that it is difficult to realize that its plantations have ever been thinned. The park, as a work of art, is suffering because surplus trees are filling up the open glades and recesses of turf along the drives, and are gradually cutting off all the vistas which gave the landscape variety, mystery and interest. For this reason the park is becoming, every year, more and more of a wood, and less of a park, as it was originally designed. But more important than the loss of design, which can always be restored in a comparatively short time, is the danger of ultimate ruin to all the trees in the park by overcrowding. In every direction short-lived, misshapen, scrubby or half-dead trees are using up the light and air and soil needed for better specimens which would last for a century if they were allowed the chance to grow. It is probably not an exaggeration to say that the park and its plantations would be immensely improved by the immediate removal of one-half of the total number of trees now growing in it, and that six months after they had been cut, not one person in a hundred thousand visiting the park would miss them or realize that the axe had been at work.

For years the trees in the park have been neglected, and they are now beginning to show the effects of this neglect. They were not properly thinned when they should have been, because the commissioners of that time declared that they feared to face the popular outcry against cutting a tree. But in these last years the people of this city have learned a great deal about their park and its requirements; they realize its value now as they have never realized it before; they know more about trees and their needs than they did a generation ago, and the commissioners may be sure that they will be supported in any well-considered and carefully studied scheme for improving the park plantations. They should not allow another winter to pass without beginning a systematic thinning of the trees under their charge, for now that they have become so large and overcrowded, they suffer more serious injury in one year than was possible in ten years while they were still small.

WE have heard, from what seems to be a trustworthy source, that the Yosemite Commission has just agreed to pay a contractor \$3,000 to "underbrush the valley." Precisely what this phrase means we do not know, but in view of what has happened when zealous choppers have

turned themselves loose with axes in that beautiful spot, the news is enough to excite apprehension. Every one who has visited the Yosemite recognizes the singular charm which the beautiful growth of shrubs and small trees gives to it. The persons who were at one time in charge of the valley certainly did not appreciate the value of this low growth and its luxuriant foliage. It is just possible that there is some one now in command who can be trusted to spend money for the "improvement" of the valley in such a way that it will not add to the disfigurement which the place has already suffered, but certainly this is a matter which ought to be discussed and explained. This valley belongs of right to the people of the United States. Its unique beauty and grandeur should be theirs to enjoy, and for their children to enjoy forever. It would be a disgrace to civilization, as well as an outrage upon the plainest justice, if any unskilled hand is allowed to be lifted up against the trees and shrubs of the valley. What the people have a right to demand in such cases is the widest publicity. No one will question that for any alleged improvement of the Yosemite Valley there should be a fixed plan, and that this plan should be published; that no haphazard work should be undertaken; that not a tree should be cut, and not a lane laid out without minute directions and without every needed restriction and protection against possible injury to the beauty of the place.

Let the people know just what is going to be done in the Yosemite Valley, why it is to be done, and who is to do it.

THE forty-first volume of *The Garden* is dedicated to our excellent correspondent, Max Leichtlin, of Baden-Baden. In the dedicatory remarks we learn that he was born at Karlsruhe, in Baden, on the 20th of October, 1831. When fifteen years old he became an apprenticed gardener, and afterward held gardening situations at Frankfort, Bolweille and Ghent. Some years of his life were then spent in traveling, and in 1856 he returned to Europe from South America; then, after spending a few months in Dublin, he served for two years in Van Houtte's nursery, in Ghent, which at that time was considered one of the best schools of horticulture in Europe. Leaving Ghent he engaged in the business of paper manufacturing with his two brothers, and for sixteen years devoted himself exclusively to this occupation. Then, having amassed a considerable fortune, he retired to Baden-Baden and founded the private botanical garden which has since made the name of Max Leichtlin a household word wherever hardy plants are grown. No man of our time has introduced so many first-rate hardy plants into cultivation, and no one has been more successful in cultivating and propagating them. Bulbous plants especially have interested Max Leichtlin, and his collection of Lilies at one time was the richest in existence. Afterward he devoted himself to Irises, and has introduced many interesting species. As a raiser and hybridizer he has achieved great success with the Nerines and Aubrietias, some of the best varieties of these handsome genera being due to his patient skill and perseverance. It is to him that gardens are indebted for *Jankæa Heldreichi*, *Ostrowskia magnifica*, the largest known Bellflower, *Meconopsis aculeata*, *Tellima parviflora*, and a host of other plants, including many Lilies, Tulips, Alliums and Irises, especially of the bulbous and *Oncocyclus* sections. Max Leichtlin is as generous as he is successful in gardening, and his greatest happiness is found in sharing his treasures with his friends and correspondents, who are always being placed under a debt of gratitude to him, not always easy to repay in kind, as no plant interests him unless it is new or extraordinarily rare, or so difficult to cultivate that everybody else has given it up as hopeless.

The landscape, forever consoling and kind,
Pours her wine and her oil on the smarts of the mind.

—Lowell.

Cultivating the Almond in California.

THE estimation in which the almond is held in America is seen from the fact that nearly six million pounds of these nuts were imported in the fiscal year ending June 30th, 1890. They were valued, too, at \$813,000, or considerably more than all other imported nuts put together, and this, not because they are the cheapest, for they are the most expensive of imported nuts. There are no reliable statistics of the home production, but the area suited for almond cultivation is confined to a few spots distributed throughout the whole length of California, and it is doubtful if there is enough of it, all told, to supply the American market. In the last number of the *Popular Science Monthly* Mr. Henry J. Philpott gives a description of the processes by which this favorite nut is produced and made ready for holiday tables, from which we condense the following statements:

The trees are all budded or grafted, for although a seedling Almond may be an improvement on the parent tree, it is apt to be worthless, and may be deadly poison. This inclination to sport is seen even in grafted trees, for in Mr. Philpott's orchard, in which the cions were all taken from the most prolific bearers of the best nuts among tested trees, some of them never bear at all, others bear worthless nuts, one yields a nearly perfect peach-pit enclosed in a nearly perfect almond-drupe. The variety known as the California Paper Shell, originated near Mr. Philpott's ranch, is very distinct, although a purely accidental seedling. Its good size, plump kernel, thin shell, sweet flavor and agreeable appearance enable it to command two or three cents more a pound than any other nuts in the market. It is truest of all to the type and most distinct in the form of the tree. Some growers claim that it is less prolific than many other varieties, but others say that it is the most hardy and most prolific as well as the most salable almond grown, and it is predicted that it will drive the foreign nuts out of the market.

The Almond-tree resembles in size and shape, as well as in smoothness and color of the bark, an unpruned Apple-tree, while it is the image of a Peach-tree in foliage and green fruit. The leaf is so exactly like that of a Peach, to which it is nearly related, that a casual visitor can scarcely distinguish them. The same is true of the fruit in a green state, which is a peach in taste and smell. The Almond is commonly grafted on Peach-stock, and an orchard of these trees in bloom is a thing of beauty.

The cultivation of the Almond is very easy. The orchard is plowed and harrowed once or twice a year, and then the weeds are kept down in the easiest manner possible, but the tree is never pruned, and the fruit is never thinned, both of which operations cause great expense in the cultivation of other orchard fruits, while so far it is infested with no parasites, and the grower is not at the expense of buying and applying insecticides or fungicides. First to bloom in the spring, the Almond is the last to mature in the autumn. All summer long the fruit hangs, the image of a green peach, and after the first few weeks never increasing or changing in appearance. Late in August the seam, which is rather deeper than in most peaches, will open in a few of the earliest, and then the growers are anxious to know whether the almonds will open and remain open, or whether the drupe will remain closed, or will open partially and then close tight, for the whole profit of the crop may depend on the behavior of the fruit in this respect. It may cost half of what the crop is worth to pick and husk it.

The nuts are knocked off of the tree with long poles, and if they are well open they are allowed to drop on the bare ground and are husked as they are picked up. Those which do not open are husked with the fingers. The variety mentioned above is one of the freest, and its drupe often falls off spontaneously and leaves the naked nut hanging to the tree. But the nut so freed from the drupe clings tightest of all to the stem and is often hard to knock down without injury to the branches. In the best of seasons a large part of the crop is so badly opened that a canvas is spread under the tree for the nuts to fall on. When all are knocked down the canvas is rolled up and carried to a place where there is a simple table of boards. One picker rubs the nuts to loosen the drupes, and the others husk. The rubber is practically two old-fashioned washboards which slide over each other. The machine is a flat-bottomed trough, six or eight feet long, and open at one end, across the bottom of which pieces of lath are tacked an

inch apart. The nuts are scooped in, a few pounds at a time, and a shorter board, also ribbed crosswise with lath and handled like a flat-iron, is rubbed over them, loosening their husks and pushing them toward the open end of the trough, where they fall into a box to be husked. In larger orchards more complicated machinery is operated by horse or steam power, but the drupes and nuts are still separated by hand. The drupes are generally only loosened by the machine; few of them are rubbed completely off, because, if force enough were employed to remove the drupe, it would break the shell; therefore, in many orchards this year, the only way to market the almond was to crack it with the drupe on and sell the kernel.

Picking and husking almonds costs from \$50 to \$100 a ton, after which the nuts are sent to be dried and bleached with the fumes of sulphur, a process which requires care and experience. If this is done well and the nuts come out bright and evenly bleached the grower is satisfied, for he knows that it is the color which sells his almonds. It is claimed that fruit, such as apricots and apples, which is sulphured is poison, and yet unbleached fruit will not bring living prices. It is not probable, however, that sulphuring, as it is conducted, is of any real injury even to evaporated fruit, but in the case of the almond it is only the shells that are colored. As a rule, the harder the shell the whiter the almond will bleach, although this new Paper Shell of California will bleach the whitest of all.

When cured for market, the nuts are stored and shipped like barley, in coarse gunny-sacks, and although a single sack costs but seven or ten cents, the whole expense is a burden on California producers to the amount of \$2,000,000. Where grain has to be handled from five to ten times before it reaches the consumer, and all grain is shipped from the Pacific ports in this manner, the sack is a still more expensive crudity, and the grain-grower loses by it ten per cent. of his gross proceeds. But the burden on the Almond-grower is trifling, one per cent. perhaps of the gross product, and the sack is altogether an advantage, for it saves the delicate shell and furnishes a place for the brand of the orchardist, who is proud of his product and wishes to work up a reputation for it, and it also gives an opportunity for naming the variety contained in each sack.

The practical question confronting each prospective orchardist is, How soon will trees come into bearing and pay expenses and interest on the investment? Some old men who have tried it conclude that too much planting for posterity is mistaken kindness, for which posterity, lying in the shade, kicking up its heels and letting its faculties rust for want of some planting to do, returns no thanks. But the Almond is an early bearer. At four years, from seed, Mr. Philpott's orchard yielded \$80 per acre gross, say \$60 net. This year, at six years old, with prices considerably below the average, the proceeds will be \$125 an acre. Few orchards have yielded so much per tree of the same size, but these trees are so wide apart that there are only half the usual number to the acre. While the trees are small, this tells against the yield per acre. In a general way, it may be said that an Almond-orchard yields as quick a return as a herd of beef-steers, and at the same time the planter does not lose the use of his land. He plants other crops between the rows, but, of course, no ordinary annual crop will yield a profitable return from the price he must pay for land known to be adapted to almonds. The almond, most precious by weight of all orchard-products, involves less labor, care, anxiety, expense and skill than any other, excepting, perhaps, the Prune. In recent years it has never yielded the fabulous returns realized by the growers of some other fruit or nut. It never yields, as an Orange-orchard has, a competence for life in a single year from ten acres. Its reasonable expectations are about \$100 net per acre.

Wild Flowers in Italy.

ABOUT the 20th of May the Italian summer overtakes us on the hill-top where this city sits. We do not then, however, experience its full power, the still, steady fervor which July has in store, but merely the soft freshness of a perfect New England June, in response to which millions of Roses break bud and send gentle waves of perfume all through the ancient city. Roses are there everywhere. Enter a shop in the busiest street, and a great Maréchal Niel nods at you through the open window at the farther end. Pause before the open door of a frowning fourteenth-century palace, and across its paved court-yard you see a tangle of cream and crimson blossom. For there is here none of the prim formality of an English garden of "standards"—a collection of walking-sticks supporting a half dozen overcultivated flowers.

These bushes and vines were freely trimmed by their owner last autumn, no doubt, but it was in self-defense he did it; in protection of his right of way along his own garden-paths; and in spring they show a wealth of healthy green, and blossoms which rival in number, size and perfection any prize collection at an English flower-show. It is all due, of course, to what Mr. Cable's engaging heroine called "doze climéd," and if climate can do all this for us within city walls, what need to wander restlessly abroad, exploring country roads and lanes? Yet such strolls when the afternoon shadows have grown long, and the afternoon breeze comes breathing up over the piny hills and poppied fields from the unseen sea, are very wholesome both for mind and body, especially the former; and out in the open country we find a most rich and varied vegetable life; old friends whose welcome is sweet, new faces with whom one longs to make closer acquaintance.

But, alas! you will, to carry on the metaphor, find it next to impossible to procure a proper introduction to these rustic beauties. Their very names, for the most part, will remain unknown. I do not think there is such a thing as a handy botany of this district, and to the average Italian of the lower class wild flowers are objects which it would be beneath his dignity to observe too closely. Show him an Iris, and ask him how it calls itself in Italian. Giovanni will cock his head on one side, ponder sagely, and, four chances out of five, pronounce it a rose. "Angiolina," I asked the other day, as she and I were passing a clump of the great, pale lemon-colored Dandelions of the region, "what is the Italian name of those flowers?" She looked at me bewildered. "Signorina, I haven't the remotest idea." Not to be discouraged, I pursued my catechism. "Do they ever grow any larger than those?" They were full two inches in diameter. "Oh, yes, signorina," she replied briskly, "much larger; and then," triumphantly, "we call them Sunflowers."

When one is thwarted in this fashion in the pursuit of knowledge it is better at once to renounce the vain thought of imparting useful information, and only repeat to those who may be disposed to give them a practical trial some of the suggestions which this country-side calls up.

The field at your left is dyed deep crimson with the splendid blossoms of the Sainfoin, or dark red Trefoil, long a favorite in France, and sown in greater quantities every year both here and in England, where enthusiastic praise is bestowed on its virtues as fodder, whether green or dry. I think it might prove of practical value to our serious farmers, but let the amateur, at all events, try a belt of this Clover on the dubious boundary between his lawn and mowing-field, sowing thickly in early spring. Let him be careful to get the true crimson variety, and not that which flowers rose-pink, and after watching its rich green growth and the opening of its close-set sturdy heads, I will predict that, if he rejects the Sainfoin as a crop, he will keep it up as an ornament.

Now lean over the hedge, and continue the line of your meditations. The lane you are following winds steeply up a hillside, and between its boundary hedge and the level of the field beneath there is an almost perpendicular drop of eight or nine feet, and on this abrupt slope a dozen sorts of grain and tall blossoming grasses are nodding their heads in enticing confusion, completely veiling it with a covering delightful to the eye of the casual observer. Is not this a suggestion for that terrace front beyond the garden, to which the hose will not reach and which always turns brown so early in the summer? You may not succeed quite so well in your combination as nature does after a century or two of self-sowing; but an average seed-chest has resources which are not to be despised, and with a little patience these may be most effectively supplemented by our beautiful wild grasses, and the bank thus laid down will be an inexhaustible resource for your flower-jars. I remember certain narrow, deep-cut, Beech-shaded lanes in Surrey where native grasses were said to have been systematically sown some years before, with the most beautiful result at the time I wandered there.

And here I would like to put in a plea for the formation amid so many Societies for Rural Improvement, of one for the Preservation of Lanes. Broad ways, between unbroken lines of evenly spaced Maples or Elms, and trim bands of close-cut turf are pleasant and desirable in their place, and their place is a large one; but there should be room as well for the narrow winding lane where the horses walk rather than trot, and the air always bears some woodland scent—the spicy fullness of the Pines, the delicate sweetness of the wild Grape-bloom, or the pungency of the Barberry; where the Birches leave room for Sumac and Blackberry vines, and the Asters and Golden-rod blow no less bravely because Columbine and Violet have preceded them.

I would have my society do something also for the bare "cuttings" and dreary borders left along new roads, assisting nature in her slow business of clothing them gracefully. Its province, and that of the road commissioners, should be clearly defined and separated, and it should be composed of members all ready to take suggestions from nature's methods, and to try perpetual experiments in the introduction of the wayside beauties of other lands; content to have a dozen fail if one may but succeed. Let us see what can be done with some of the wild Roses of Switzerland, above all that tall, red-stemmed bush which bears flowers of a deep Jacqueminot crimson, among its blue-green leaves; or, to come back to this Tuscan country, with the pure white Sweet-brier, which grows luxuriantly hereabout by the side of the common pale pink variety. And one or two of the sweet-scented Honey-suckles which gush over these hedge-rows, intertwined with a Clematis which I have seen rioting at home, could they not be coaxed to endure the New England climate? Certainly there are places in America where the Rock Rose might be enticed into springing, as it does here, from the face of the most incurably barren cliff, and where the yellow Tulip and lavender Iris might follow the line of some meadow causeway. Let us have, too, the hardier Thorns, both for the sake of their spring blossoms and their winter haws, and there is a species of ground Holly, with a showy scarlet fruit, nearly as large as a small cherry, which is warranted to render any spot inaccessible to marauders, and might be found useful as well as ornamental. There is also the pale, primrose-colored Dandelion, of which I have spoken before. It is a gorgeous flower, but I cannot give it a first-rate moral character. It is undoubtedly a sybarite, and rather than lead an honest independent roadside existence, it clings to the luxuriant life of the market-garden, and prefers to hang on to the skirts of society there, even at the perpetual risk of being ignominiously expelled.

A little later, when summer is at its fiercest here in Tuscany, our lanes will blaze with the most superb Thistles, high and low, big blossoms and small, single flowers and clustering heads, bright blue and royal purple, silver-white and tawny orange; but the Thistles, too, shall be left undisturbed, and, indeed, our Asters and Golden-rod give much the same range of blossom-color, though their foliage cannot be compared with the sculpturesque and highly decorative leaves of the Thistle. It occurs to me, however, that by insisting too much on the æsthetical properties of the Thistle I may weaken in the eyes of the gardener at home the force of my practical suggestions, so I will close these desultory remarks before compromising myself further.

Siena, Italy.

Louise Dodge.

A Bed of Hardy Perennials.

"THE well-furnished garden should be gay with blossom throughout every month of the growing season."

This axiom being indisputable, we have suddenly awakened to the conviction that our garden is deficient in midsummer attractions. A few Roses are blooming for the second time, notably Madame Alfred Carrière, which is making a display that would be very creditable even in early June, and that is worthy of all praise in this sultry July weather, and Madame Georges Bruant, which is almost as lavish of flowers as its more graceful neighbor.

The long borders behind the house are very gay with Geraniums and sweet with Heliotrope and old-fashioned annuals, and in the shrubberies are many tall, cool-looking Hollyhocks, pink and white and mauve, with double and single flowers, with groups of various Hypericums, whose yellow flowers are most acceptable and cheerful. But with all the lavish beauty of Trumpet-creepers, beloved of humming-birds, and Clematis of many kinds, we feel that there is something lacking, and are conscious that we have sadly neglected two very valuable classes of midsummer flowers. These are the herbaceous perennials and the newer annuals.

The truth is that our devotion to trees and shrubs has been so faithful and absorbing that we have had no time to spare for the humbler denizens of a "perfect pleasaunce." Now, however, that we are awakened to a sense of our deficiencies we have turned our attention to our nearest neighbors in marsh and meadow, and are trying to induce some brilliant blossoms near at hand to be content with a change of residence from field to garden-border. We have taken up large clumps of *Asclepias tuberosa* in full bloom and transferred them to our shrubberies. Any one who has tried to move these handsome plants on a sultry day in July will doubtless remember the undertaking. Almost inconceivably long and tenacious are the roots, which they thrust into the rocky soil. It was

almost an impossible task to carry out my instructions that the plants be removed with earth about them and with unbroken roots. Of five clumps planted a fortnight ago only one is in a flourishing condition at this time.

Much better fortune has attended a large bed of late-blooming perennials planted a few days ago. These came from Mr. John Saul, of Washington, a careful grower of everything a garden ought to possess.

Our summer hammock swings from two large Oak-trees on a little eminence which commands a wide view of field and wood and mountain-range on one side, the grove, with its winding roads and shady glimpses, on the other, and a smooth expanse of shrubbery-bordered lawn just in front. At the extremity of this little lawn is the new bed, already interesting with many blooming plants. These were carefully packed and sent with balls of earth around the roots, and cool damp moss to refresh them during the journey. They were at once transferred on a cloudy afternoon to their permanent resting-place.

This morning the tall-blooming Phloxes are as fresh as Phloxes can be, and seem to be gazing with wide-eyed approval at their new surroundings. Unfortunately there are many undesirable colors among the flowers of Phloxes, and it is very difficult to group them effectively. Among our scarlet Geraniums at the back of the house, the magenta and solferino of some ancient Phloxes that will not die are very incongruous, and I frequently take myself to task because I lack spirit to exterminate them. But they are relics of the past, and were familiar to my childhood, and so, from year to year, they are allowed to injure the color-effect of our Geranium-bed. The new Phloxes just received are in softer shades; some are pearly white and others a faint pink with darker eyes. All these are grouped together, apart from other plants, and are best so, belonging as they do to such a very exclusive family.



Blighted Leaves of Pelargoniums.

The Blackberry Lily, *Pardanthus Sinensis*, which was in bud when it came, has opened a few handsome blossoms, and the Campanulas and *Platycodons* are beginning to flower afresh. A very few of the new plants are drooping. We water them in the twilight and shade a little during the day. The weather is warm and unfavorably dry, yet we have every reason to rejoice in the success of our experiment.

The new Yarrow, or *Achillea*, called the Pearl, is blooming profusely, and does not seem to recognize any difference between the nursery in Washington and the garden at Rose Brake.

Rudbeckias are charmingly bright and saucy, and a *Sedum* labeled *Sedum Silskanum*, which is new to me, is showing a few yellow star-shaped blossoms.

This bed is very conspicuous from the hammock, and will, no doubt, be a constant source of pleasure as the plants increase in beauty day by day.

Rose Brake, W. Va.

Danske Dandridge.

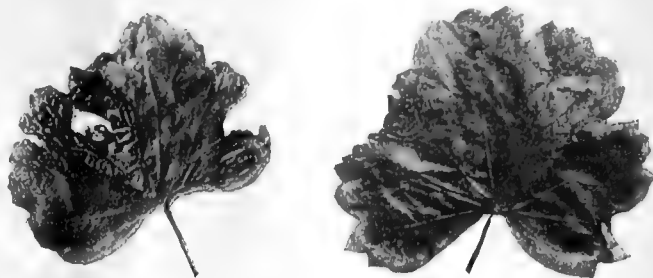
Cultural Department.

Blight of Variegated Pelargoniums.

GARDENERS are getting shy of some of the variegated plants. Last evening, while talking with a large grower of foliage plants, it was learned that he had discarded some of the plantain Lilies, and particularly the *Funkia undulata*, var. *variegata*, because they blight so badly. Such plants will do well for a part of the season, and as soon as the more trying days of midsummer come, they become unsightly and worthless.

Attention at this time is called to a similar behavior of the variegated Pelargoniums. Some of these are very showy border-plants, so long as they remain in good health. Under the most favorable circumstances, plants of these variegated

sorts may retain their handsome foliage, but as a rule the leaves become blotched and brown. While there is no doubt that variegated plants are abnormal, in so far as their chlorophyll or "leaf-green" is reduced, and, therefore, less able to



Blighted Leaves of Pelargoniums.

compete with ordinary plants in the making of food out of the crude materials of the soil and air, it is likewise an observed fact that such plants fall more easily a prey to the attacks of parasitic fungi. In short, a variegated plant is inherently weak, and, therefore, less able to resist the enemies that are constantly lurking without.

It is regretted that the photographic art does not show all shades of color in the pictures of variegated leaves. If the engraving could fully present the colors, the reader would not need to be told that the blighted portions of the several leaves shown are invariably upon the white or etiolated parts of the foliage. Upon these light areas the fungi, of which there are two, usually vieing with each other for the blanched territory, establish themselves and then spread to other and green parts of the leaf. These two fungi are indistinguishable except with a microscope. One of them is a member of the genus *Ascochyta*, and may be termed a genuine leaf-blight; the other is an anthracnose, and belongs to the genus *Collitotrichum*. It is difficult to convey an adequate idea of the structure and habits of these fungi without engravings to accompany the text. This is not the purpose of this article, but, instead, to account for the blighting of the Pelargonium leaves, which is due to these low forms of parasites being favored in their development by the blanched or non-green condition of parts of the leaves. Spraying with fungicides would doubtless assist in checking the growth of the fungous enemies.

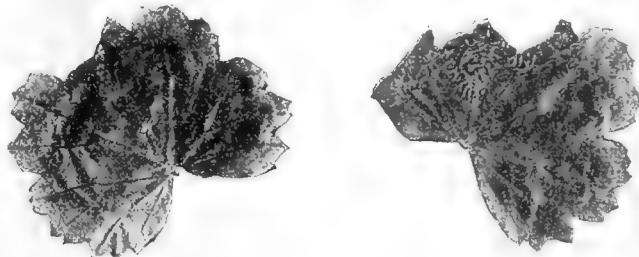
Rutgers College.

Byron D. Halsted.

Notes on Shrubs.

IT is never safe to draw conclusions from or pass judgment upon one or two specimens of any species or variety of tree or shrub, or, indeed, of any other plant. This is especially true in testing hardiness, longevity, habit, productiveness or free-flowering character. When plants are received from nurseries it often happens that all the individuals of a kind are the progeny of one particular plant, and this may have peculiarities which are not common or typical to the species or variety as a whole. The variability shown in a large series of seedlings is often very interesting, and the extremes are frequently so different as to suggest the need of separate names. Indeed, such extremes have often been described as distinct species.

A look over a lot of seedling plants of our pretty and fragrant-flowered *Rhododendron arborescens*, or smooth *Azalea* of the Alleghany Mountain-region, exhibits marked variability



Blighted Leaves of Pelargoniums.

in certain directions, and shows how a purchaser of a seedling plant might get one which did not fulfill the expectations raised by a description of it. The flowers vary in color on different plants from a pure white to a very appreciable rosy tinge. There is a good deal of variability in the size of the

blossoms, but the abundance or scarcity of bloom on different plants is still more marked. Certain plants appear to have the habit of flowering much more freely than others, and of bearing the blossoms well above the foliage, which last is a result of less vigorous new growths or the habit of the plant to put its energies into the flowers instead of devoting them to the formation of long new shoots. Ordinarily, and when less abundant, the flowers of this species are somewhat obscured by the new growths and foliage. The botanist, of course, will find much variability in the minor details of the leaves, flowers, etc., but these are not generally interesting to the horticulturist.

R. arborescens has been compared with our northern Clammy Azalea (*R. viscosum*), and in some respects they are somewhat alike. The flower-buds of both are covered with hairs which are tipped with dark-colored viscid glands, but, as a rule, these hairs are most abundant on the Clammy Azalea. Great numbers of minute insects are often ensnared by the sticky secretion of the glands. The buds of both species are about the same length, but those of *R. arborescens* are stouter, and when they open the expanded blossoms they appear much larger than those of the other species, and this adds greatly to their beauty. While the stamens of the Clammy Azalea are usually white, with the pistil sometimes reddish, the stamens and pistils of *R. arborescens* are of a bright deep rosy red color, which is well set off by the white corollas.

It has been stated that these two species of Azalea are marked by a difference in the time of blossoming, and in the main this statement is quite true.

This season *R. arborescens* began to blossom here about the 20th of June, while the first flowers of *R. viscosum* did not open until quite ten days later. *R. arborescens* is now (July 10th) quite generally without a flower; but, among probably over a hundred plants raised from seed, there are two which are just in their very finest condition of bloom, being quite as late as any *R. viscosum*. Where lateness of flowering is a desideratum, such individuals as these might be well worth propagating if they are any improvement on the best-selected forms of *R. viscosum*; poor forms of this species are not worth a place in the garden, and are, perhaps, quite as variable as *R. arborescens*. Where a large number of seedlings can be seen together there will appear even a greater difference between individuals in thin foliage. The differences in foliage have been noted by botanists. A very common form has the leaves green on both surfaces, but a great many plants have foliage which is quite glaucous beneath, in which they resemble *R. arborescens*, while occasional specimens have the leaves glaucous on both sides. The leaves vary from being perfectly smooth on both surfaces on some plants, to those which have the upper surfaces of the leaves and the midrib beneath thickly covered with very stout appressed hairs or bristles, which are bent toward the apex of the leaf. The young shoots of this Azalea are clothed with stiff hairs, which are bent toward the end of the shoot, and this character is at once the best in distinguishing it from *R. arborescens*, in which the young shoots are quite smooth. In the best forms of the Clammy Azalea the flowers are about as large as small or medium-sized blossoms of the other. The plants are inclined to grow tall without spreading greatly, while those of *R. arborescens* in cultivation here, now eleven or twelve years old, from seed, are of a more dwarf, compact habit, with a spread of branches as great as the height, which is from three to four feet. Any peculiarly fine form of these Azaleas is much better propagated by layering than by any attempt at grafting by an amateur. *R. viscosum* is now sometimes freely used as a stock upon which to graft garden varieties, but it appears to have an annoying tendency to send up suckers.

Our Purple Azalea, or Pinxter-flower (*R. nudiflorum*), is well known for the variability in color of flowers which different plants exhibit in a wild state. By selection we may get plants of this species with flowers almost white, varying through flesh-color to pink or purplish.

The pretty *R. vaseyi* has been described as having flowers of a bright pink color, but a look over a lot of seedlings when in blossom in May shows much variation in the shades and depths of color, while several individuals here bore flowers which were almost white. An amateur horticulturist, who obtained through the Arboretum one of these seedling plants before it blossomed, expressed great disappointment that when it bloomed its flowers proved to be white instead of the bright clear pink which was desired. Such tendencies to variation among the different individuals of the several species of these pretty flowering native plants show very clearly that it is sometimes necessary to grow more than one seedling from a parent plant in order to exactly reproduce it in some desirable

even though typical, character, and that propagation by some form of division is the only safe and reliable way to perpetuate any peculiar characteristic.

Arnold Arboretum.

F. G. Jack.

The Water Garden.

THE Water-lily ponds and basins are now the most delightful spots in the garden. Growth was somewhat retarded during the cold, backward spring, and this has had a marked effect on some plants, but the latter part of June was most favorable to their growth, and the result is at the present time a gorgeous display of all the hardy *Nymphæas* which come in for first honors. *Nelumbium speciosum* follows hard after them, its first flowers opening the second week in July, but they will be at their best when some of the hardy *Nymphæas* are past. The new varieties of the latter are rapidly increasing, and so is public appreciation of them, for the supply has not equaled the demand this spring. Besides the sorts of sterling merit described by Mr. Gerard in the issue of this journal for July 13th, I would mention *Nymphæa Marliacea rosea* as worthy of a place in every collection where even a few can be grown. The plant is vigorous, resembling *N. alba* in style of growth; the flowers are freely produced, and until late in the season its lovely cup-shaped flowers on opening are a tender rose color several shades deeper than those of the variety *Carnea*. When fully expanded the petals are much lighter, but they retain their color at the base.

The variety *Exquisita*, of *N. odorata*, has flowers more deeply colored than any other hardy *Nymphæa*. These flowers are large, of rich rosy carmine, and with delicious fragrance. The leaves are green on the upper surface, and intensely red on the reverse.

I consider *N. odorata sulphurea* one of the very best new hybrids. The plant is very vigorous for the odorata type; its large cup-shaped flower, standing out of the water, resembles a Lotus-flower in the distance. The color is more accurately described as a canary than as a sulphur yellow. It has light golden stamens, and petals narrower than those of *N. chromatella*, but longer and more numerous, while it retains the fragrance of *N. odorata*. The leaves are reddish on the reverse, heavily blotched with reddish brown. It flowers freely, and is a great acquisition.

Nymphæa pygmæa helvola is another hybrid of special merit. The flower is about three inches across, sulphur-yellow; petals longer, narrower and more pointed than those of *N. pygmæa alba*; the leaves deep green, blotched with reddish brown. It will be found very useful for tubs or small aquariums.

Nymphæa Laydekeri rosea is larger than the preceding variety, but is a most worthy novelty of the *Pygmæa* type. The flower on opening is a delicate pink, and the second day it is many shades deeper, the sepals retaining their whiteness. The stamens on the outside ray are rich yellow, while the centre ones are orange—a most pleasing combination of color. The third day the flower assumes a deep rose color. The plant is stronger than the type, and very free-flowering; it frequently shows flowers with all these different shades of color at once, as some of them open almost daily. These different colors are distinct enough to give the plant a novel appearance, as they inevitably suggest two or more kinds of flowers from one root.

Dongan Hills, N. Y.

W. T.

Alstroemeria aurantiaca.—The *Amaryllis* family is well represented in our gardens, but the genus *Alstroemeria*, which belongs to it, has few representatives in American gardens. The reason for this is that many of the species are too tender to endure our severe winters. One of them, however, grows vigorously here, and makes one of a group of striking beauty. *A. aurantiaca* is still flowering here, and only requires a covering of dried leaves in the winter. Three years ago I received two small tuberous-rooted plants, which I planted in a sheltered position in good deep sandy soil. They have grown so vigorously that they cover a space of three feet in diameter. I know several gardens where this plant has failed, but the reason of this is, without doubt, an unsuitable position or unsuitable soil. It is an important point to plant the tuberous roots deep in the soil, where the frost will not get to them. After they are established they should not be disturbed often. This *Alstroemeria* was brought from Chili in 1831. It grows about four feet high, and the stems are so stout that if it is grown in a sheltered position they do not require staking. The leaves on the stem are lanceolate-obtuse, and the petiole has a peculiar twist which inverts the leaves. The blossoms are large, orange-colored, streaked with red, and are produced in umbels of from twelve to fifteen flowers. Last year when I visited the

Royal Botanic Garden at Glasnevin, Ireland, I saw a most beautiful bed of these plants. At a distance it looked like a bed of dwarf Azaleas. Some of the species in this collection were Tricolor, Aurantiaca, Hæmantha, Simsii, etc.

Alstrœmerias can be grown either from seed or by division of the roots. The young seedlings require to be grown under

it adds another to an altogether too small a list of dwarf Harebells which will endure our severe winters. *C. rotundifolia* holds its own well and sows itself freely. It is a charming rock-plant, around which much sentiment clings since it is the true Bluebell of Scotland. *C. gargarica* planted this spring is blooming nicely, but it will need to be lifted in the autumn,



Fig. 60.—The California Locust (*Umbellularia Californica*).—See page 349.

glass for some time until they are strong before planting them in their permanent positions.

Botanic Gardens, Cambridge, Mass.

R. Cameron.

The Harebells.—*Campanula abietina* bloomed on our rock-garden for the first time this spring. It is comparatively new, from eastern Europe, and is a neat tufted species, with airy panicles of violet-blue flowers. It is particularly valuable, as

or we shall lose. This and its hirsute variety are often grown in pots, and may be commonly seen in cottagers' windows in England, suspended, their trailing branches sometimes hanging one foot or more.

Wellesley, Mass.

T. D. H.

Abortive Strawberries.—One cause of the formation of "nubbins" in Strawberries is, undoubtedly, lack of pollen. At the Cornell Station several Strawberry-blossoms were fertilized,

different flowers receiving unequal amounts of pollen. Perfect berries were formed by flowers in which all the stigmas upon the receptacle were treated. When only one-half of the stigmas was pollinated the fruit was smaller, the untreated half not having grown in any marked degree. What should have been the apex of the perfect berry was drawn over to the untreated half. Other flowers had about one-fourth of the stigmas fertilized. The berries produced by them were about as large as the preceding, but they were still more misshapen. The seeds were rather far apart, but otherwise the pollenized section presented a normal appearance. A seed would occasionally be missing, but this did not prevent the full development of that part of the receptacle. It was only where several seeds were wanting that a stunted growth was the result.

Cornell University.

E. G. Lodeman.

Galium aristatum.—This plant was sold a few years ago in considerable quantities as the Woodruff (*Asperula odorata*), from northern Europe, to which it has, in fact, very little resemblance. It grows to the height of three feet or more, and has large open panicles of minute white flowers on very slender stems. These panicles, when cut and used with other flowers, are very effective in softening and uniting their colors, as they surround them like a fine spray or mist. The flowers of the *Galium* also have the advantage of a delicate fragrance which faintly resembles that of Buckwheat-blossoms. When once established the plant takes care of itself and soon makes a large clump, which keeps in bloom in this latitude almost throughout the entire month of July. Much better known than this plant is *Gypsophila paniculata*, which also has small thread-like stems and small white flowers, which can be used for a similar purpose. It commences to bloom two or three weeks earlier than the *Galium*. Rather later than the *Galium* comes the best of the hardy *Statice* (*S. latifolia*), which is practically everlasting. No one who has once tried these plants will ever consent to do without them, for, although not strikingly beautiful in the border by themselves, they add grace as cut flowers to almost any others with which they are grouped. With these hardy perennials should be mentioned the little annual *Gypsophila muralis*, which has exceedingly fine stems and leaves and tiny pink flowers, and is also most useful in producing similar effects. Nothing adds so much to the beauty of a bunch of Sweet Peas as a few sprays of this delicate plant.

Montclair, N. J.

S.

Sobralias.

SOBRALIAS are not the most popular of the Orchids, but they are more thought of now than they were a few years ago, when the genus was seldom represented in collections. But they form a very interesting group, not difficult to grow, and although the flowers last but a few days in beauty, they open in succession, thus maintaining a prolonged display. One great charm of the genus is its distinct expression. The Sobralias are different from the majority of Orchids in flower and habit, and should therefore be grown if only for the sake of variety. The growth is slender, the leafage abundant, and each stem will bear on an average about six or eight flowers, varying, of course, according to the robustness of the specimen.

The Sobralias are terrestrial—that is, they belong to that group of Orchids which should be grown in pots, and the soil must be fairly open, so that the roots may run freely in it. Beginners in the cultivation of the Sobralia should provide plenty of root-space, larger even than in proportion to the plants, and for soil nothing is better than good fibrous peat, to which a moderate sprinkling of coarse silver sand has been added. The object of selecting somewhat lumpy peat is that the roots run freely through it, while the drainage should be liberal. It is not too much to fill pots, say, about eight inches in diameter, almost half full of crocks, those of smaller size to about one-third their depth, as without ample drainage it is hopeless to expect satisfactory growth or production of flowers. When the specimens become too large it is a very simple matter to divide them, and this affords a ready means of increasing the stock if so desired. The plants, when it is seen that they grow too large, should be turned out of the pots, the best portion of the old soil removed, and the tufts divided into moderate-sized pieces with the hand, as it is not advisable to use the knife more than is absolutely necessary. It is wise not to split them up too small, as it takes a long time for them to become established. The time for performing this work is the season at which repotting should take place—that is, when new growth is commencing—and it is one great point in repotting to make the new compost moderately firm, so that the water may

moisten thoroughly the whole ball. This is most necessary, as during the season of growth it is essential to give an abundance of water, even at the resting-period some moisture being necessary. Large plants of Sobralias are very beautiful, the reed-like growth and fresh green leafage having a peculiar charm in contrast to the delicately beautiful flowers, that are without a vestige of formality.

There are several kinds, the most familiar of which is *S. macrantha*, an excellent exhibition plant, and introduced from Guatemala and Mexico as far back as 1846, the variety *Splendens* following three or four years afterward from the same land. The type is almost too well known to describe. It must be a poor collection that does not contain an example, the stems about six feet in height, the flowers sweetly scented, large, measuring fully six inches in diameter, and rich crimson and purple in color, relieved by the pale yellow spot in the centre of the bold lip. There are several varieties, and allusion has been already made to the form called *Splendens*, so named from its richly colored flowers, although we may say that shape is sacrificed to color, the flowers not having the form of those of the type. *S. pallida* has very large blooms, delicate rose in color, the lip having a faint trace of color, and in "Woolley's" variety a conspicuous trait is the dwarf growth, the flowers also of great beauty. A very handsome species from British Guiana is *S. Liliastrum*, the flowers of which are large, white and yellow, appearing during the present month. *S. rosea* is very dark in color, the flowers quite of a mauve tone, the lip crimson, white in the centre; while in *S. xantholeuca*, a species of striking beauty, they are very pale yellow, the frilled lip of a deeper tone.

This is an age of new Orchids; and recently we have had a notable addition to the Sobralias in *S. Lucasiana*, which was awarded a first-class certificate at the meeting of the Royal Horticultural Society on June 21st last. It was shown by C. J. Lucas, Esq., Warnham Court, Horsham, whose collection is of great interest. As regards habit, *S. Lucasiana* is much like any other Sobralia, the growth moderately tall, very bushy, and the flowers of characteristic shape. They are very compact in shape, the sepals white, faintly touched with rose, the petals broader, and deeper in color; the lip is of splendid shape, round, very broad across the central lobe, and rich purple-lilac in color.—*Gardeners' Magazine*.

The Forest.

The Forest as modified by Human Agency.—I.

FROM an introduction to a course of forestry-lectures, delivered before the University of Edinburgh in their session 1891-92 by Colonel Bailey, University Lecturer, Conservator of Forests and Director of the Indian Forest School, printed in part ii., vol. xiii., of the *Transactions of the Royal Scottish Arboricultural Society*, which has just reached us, we have made the following extracts, which appear to be of general interest as bearing on the question of forest-preservation in the United States:

"In early times the greater part of the dry land was, no doubt, covered with trees and shrubs of various kinds, each kind flourishing and maintaining itself in the locality best suited to its special requirements. As the older trees fell to the ground their places were taken by others of the same or of associated species, which grew up in the openings thus afforded to them, and an unbroken succession of trees and shrubs was in this manner maintained; for at that remote period but few of those destructive agencies were at work which have raised forestry to a science.

"What is the foremost among these destructive agencies? Unquestionably man.

"It is no doubt true that natural phenomena, such as storms of wind, have always occurred from time to time; but the forest-growth would, in most cases, surely, if slowly, re-establish itself after each visitation, and the damage done by four-footed animals, insects and noxious fungi would not be likely to make much impression on the vast extent of forest which then covered the earth's surface. The human population of the world was small, and the requirements of men were by no means so varied and extensive as they are at present. But as population increased, man had to extend the small patches of cultivation which were the scene of his first efforts in the art of agriculture, and he wanted timber and fire-wood for domestic use. He also needed grazing-grounds for his flocks and herds. Then, in course of time, he began to build better houses with larger timber; he made boats and ships; and later on he constructed railways, and developed numerous in-

dustries which consumed vast quantities of wood of all species, qualities and sizes; at the same time he largely extended his cultivation and increased his flocks and herds; and before every one of these advances portions of the natural forest went down and disappeared forever from the face of the land. But the process was a very gradual one, extending over many centuries. It proceeded slowly at first, and not until comparatively recent times did the country begin to assume its present appearance. It is not so very long ago that the road from London to Edinburgh was an unsafe one to travel over in consequence of the gangs of robbers who found shelter in the thick forests through which it passed. Do not misunderstand me to pretend that these changes from denudation have in general been for the worse; you do not require me to tell you that up to a certain and, indeed, a very advanced point they were very much for the better.

"Long before this stage of development had been reached, however, a time had come when it was found impossible for every one to continue to help himself with a free hand; claims to ownership of forest and waste lands had been set up, and established by the law of might, and some sort of restrictions had begun to be enforced. But these were quite inadequate to arrest the progress of the destruction of the natural forest, which at length reached a point at which the supply of forest-produce became insufficient to meet the requirements of the population; and measures then began to be taken not only to secure some tracts of forest from further encroachment, but also to increase the wood-bearing area by sowing and planting. But it is not to measures of this nature that many of our largest forests owe their existence at the present day. Their continued maintenance is due rather to the protection they received under strict laws for the preservation of game than to any endeavor to guard them for the sake of the timber they could yield. The New Forest in Hampshire is a good example of this, and the same may probably be said of the Windsor Forest and of the Forest of Dean in Gloucestershire, as well as of others in Scotland.

"It will easily be understood that the countries in which civilization advanced with the most rapid strides were those from which the natural forests disappeared the soonest; and at the present time these islands have a smaller percentage of wood-producing area than is found in any other European country, with the solitary exception of Denmark. The actual proportion is as follows:

Russia,	40 per cent.	Greece,	14 per cent.
Sweden,	34 "	Spain,	7 "
Norway,	29½ "	Belgium,	7 "
Germany,	26 "	Holland,	7 "
Turkey,	22 "	Portugal,	5 "
Switzerland,	18 "	British Isles,	4 "
France,	17 "	Denmark,	3½ "

The average is 29½ per cent., and includes orchards and isolated trees in parks, hedge-rows and elsewhere.

"Countries which, like ours, have a very small wooded area of their own, have to supplement their home-grown supplies of wood from other countries which are still able to produce more of this commodity than their population can consume; and, on reference to Dr. Schlich's *Manual of Forestry*, I find that the United Kingdom annually imports

Timber to the value of about	£15,000,000
Minor forest-produce to the value of about	8,000,000
Total, about	£23,000,000

"These facts have not, up to the present time, led to any very great amount of inconvenience: (1) because our insular position affords us great facilities for the importation of timber; (2) because we have a plentiful supply of coal; (3) because our climate does not demand modifications of the nature which extensive forests are able to effect, nor do we, as a rule, suffer from any deficiency of the water-supply in our wells, springs and streams; and (4) because the geological formation and the configuration of these islands, and the climatic conditions under which we live, do not render it as necessary as it is in many other countries, that large areas should receive the protection against the effects of violent and continuous falls of rain, which is so well afforded by a crop of trees and shrubs.

"It is true that a part of Scotland has recently suffered severely from floods; but the effects of these floods bear no comparison with those produced by denudation in some other parts of the world, where the rain is heavier, the sun hotter, and the rock and soil are less consistent than with us.

"While employed by the Secretary of State for India at the French Forest School at Nancy, I visited the southern French

Alps, which have been subjected to excessive grazing, and from many parts of which not only the trees and shrubs, but even the very grass had disappeared. The surface is, therefore, no longer bound together by roots; and when the heavy semi-tropical rain falls directly upon it the soil, and subsequently the loose rock, slips down into the valley below. The water charged with these substances runs off with great rapidity, and suddenly fills the torrent-beds. These latter soon become deepened by the 'scour,' when their sides, deprived of support, fall in; and the effect of this action, going on throughout the whole system of water-courses which traverse the mountain-sides, is that, over enormous areas, the upper strata of the soil, with its fields, houses, and even villages, are borne down into the valleys, and the whole region, which presents to the eye little but a series of unstable slopes of black marl, has an extremely desolate appearance. But the damage does not stop here; for the debris is carried down to the comparatively level valleys and open country below, where it is deposited over fields, roads, railways and villages, thus doing an enormous amount of harm.

"In order to mitigate these terrible evils, the French government has undertaken the vast enterprise of regulating the torrent-beds by means of engineering works, and of afforesting the mountain-slopes over an area of more than a thousand square miles, including nearly two thousand linear miles of torrent-beds. The cost of such an undertaking is, of course, very great, but the circumstances warrant the expenditure.

"A very similar condition of things prevails in the Hoshiarpur District of the Punjab, on which I had a short time ago to submit a report to the government of that Indian province. I have conversed with men who remember this range of hills covered with trees and tall grass, which were the home of the tiger and other wild animals; but now there is hardly a blade of grass to be seen, and the hills are gradually being washed away and deposited on the plains below. I am told that the bed of the Mississippi is being blocked by sand and soil brought down from the mountains of the 'Far West,' in consequence of the extensive clearings that have been made there during recent years.

Correspondence.

Vernon Park, Philadelphia.

To the Editor of GARDEN AND FOREST:

Sir,—Some time ago I promised to give an account of what we were doing about Vernon Park, but as usual there is a struggle with some personal interest when any good thing for the public is to be accomplished, and in this case we have had on our hands a lawsuit with some disaffected citizens. The case is now decided, however, in the city's favor, and on the 1st of July we placed the property in charge of a city superintendent.

This little park contains about eight acres, and among the areas for small parks we have taken, it is second in importance only to Bartram's Garden. Being in the heart of the Germantown district, or the twenty-second ward of the city of Philadelphia, it is just where the lover of trees can have an opportunity to see some grand old specimens, and convenient to the poor people and their children, who wish a breath of fresh air and an open space to enjoy themselves in. Before this place fell, providentially, into the hands of the Wisters, who have preserved it, it was owned by an old Philadelphia banker named Meng, who was among the very early patrons of gardening hereabout. He was the chief patron of Kin, who was one of the first botanical collectors in the then dangerous wilds of America, though, singularly enough, his name has never been honored as have those of Rafinesque, Nuttall, Lyon, Pursh and others, possibly because he was in a measure isolated from the public by his German connections. He appears to have been sent here by some patrons from Germany, and his American specimens are still preserved in the Botanical Museum at Berlin, as I am advised by Professor Krug. Some of the first specimens of our rarer Alleghany trees were introduced here by him. Undoubtedly the earliest cultivated *Magnolia macrophylla* is here, and it was brought here by Kin. It was, unfortunately, struck by lightning some years ago, and the exposed wood down the trunk of the tree which was not painted to keep out the water has decayed from one side. I think, however, the good gardener, who, in these days of political appointments, has been fortunately selected to superintend these grounds, will arrest further decay, and that the great wounds will heal over, a result which the good tree is now bravely trying to effect.

The park is not paid for. When I first began this small-park campaign on our city my plan was to negotiate with the owners of the ground so as to make the best bargain possible for Philadelphia. For the first little square we took, that of Weccacoe, the owners demanded \$20,000. It was a small plot, but I had it taken so as to make a precedent of getting possession of abandoned grave-yards. I and my colleagues, five of us, who were a Committee of Councils, considered \$10,000 an adequate payment, and we therefore had an appropriation of this sum made, and offered it to them. The owners finally took this amount, and yet it was freely stated that part of this money was needed to defray the "cost of getting the matter through Councils"; and this accusation was spread by the attorney of the owners, who is said to have received \$1,200 for his services. It was very evident that, no matter how honestly public business of this kind is conducted, there will always be a suspicion that there is a job in it. Since that time I have changed the practice, and land is now taken by award of a jury regularly appointed by the court, and the money to pay for these lands is raised by the usual process of mandamus on the city treasury. This is the only way to protect ourselves against ungenerous accusations. Vernon Park will probably cost nearly a quarter of a million of dollars, but public-spirited citizens have already subscribed one-tenth of the sum in view of its advantages and size.

I once looked upon these breathing-places for the poor in large cities with the eye of an artist, valuing them primarily as spots of beauty and ornament to the city. It was my desire that they should all be educators in taste and landscape-art. I still would have them beautiful, provided this did not interfere with the real needs of the poor. I look upon them now as playgrounds and places where all kinds of physical recreation can be enjoyed, and I leave the details of garden beauty and the ornamentation of the city to take a subordinate place.

Fortunately for our Vernon Park, while lovers of the beautiful in nature, as well as those who delight in historical associations, will have full satisfaction in it, about one-fourth of the whole space is open lawn, which will be so arranged that the children can romp and play on it and enjoy themselves as they will.

Germantown, Pa.

Thomas Meehan.

Gardens in Northern Germany.

To the Editor of GARDEN AND FOREST :

Sir,—As the Forest Department of the German cities is a distinct branch of the municipal government (see GARDEN AND FOREST for May 4th, p. 214), so is the Field Department also a separate organization, in which is included the official oversight of the suburban gardens, which are found in every direction, either adjacent to the main promenades and shaded walks, or further away, where they were established often many years ago. No one ever hears it said in those cities, "I am going to make a garden this year." A piece of land once a garden is always a garden there, and by good management it increases in value yearly, and is kept in the family for generations. The country abounds in numerous lakes and rivers, great and small, and care is generally taken to place the gardens close to the water's edge, so that steps may lead down to it, or a platform extended over it, and provided with seats for the members of the family. Here angling is also a favorite pleasure. The waters abound with fish of all kinds, and a floating fish-box is a certain and necessary article in the household, so that fish may be kept fresh in their natural element; nobody eats fish which are purchased after they are dead. Laws in relation to the taking of fish out of the waters are strictly enforced, so that the future generations may also have an abundant supply. The largest fish are not taken, but left in the waters for propagation.

The fertility of the garden-soil is kept up by carefully saving all waste and every fertilizing product. The waters are not polluted by sewage. The gardens are generally divided by hedges, but of late wire fences are also much used because they are cheaper and need less care. The wealthy and more prominent people have houses built where garden-parties are held; others have only small, but quite ornamental, cabins or rustic arbors for holding their tools in security when not in use. The land is spaded, for the trees and different berry and flower bushes will not permit the use of horse and plow. A family garden contains little or no turf; every bit of ground is made to produce its utmost. All beds are laid out in straight lines, and the various vegetables are set where each can secure the amount of sunshine and shade it needs. Most people have two gardens, one of them called the wet garden, where they raise their cabbage and vegetables for winter's use. Often

a part of those outlying gardens is sowed with Flax, also for family use.

The work is mostly done by women. In fact, their life and that of the children, when they are not at school, is practically spent in summer in the garden. Without any special effort the younger generation in this way becomes acquainted with all kinds of practical garden-work and knowledge of natural history. The natural sciences, and especially botany, are taught in the public schools, and when a plant or insect unknown to a child or its parent is discovered it is preserved, and the next day sent to school to be identified by the teacher. Woe to him if he cannot give the needed information. His whole influence and reputation are lost. This is a serious matter, for schools are not free, and the parents, who have to pay for the tuition of their children, are keenly interested and anxious to find out whether they are getting their money's worth of instruction. My observation in this country leads me to suspect that the people most benefited by free schools appreciate them but slightly, considering, perhaps, that anything which costs nothing must be worth little.

Hartford, Conn.

Wilhelmine Seliger.

Wintering Half-hardy Plants.

To the Editor of GARDEN AND FOREST :

Sir,—The possibility of growing out-of-doors many more things than we do by protecting them in winter, as suggested by Professor Massey, is an interesting subject, and I have no doubt that many plants could be added to those now cultivated in almost all localities. There are here specimens of the *Melia Azederach* and *Bumelia tenax*, which were coaxed along at first by a little shelter in winter, and which are now taking care of themselves. Last winter the following plants were left out without any protection beyond that afforded by large shrubbery, and all are thriving to-day: *Cleyera Japonica*, *Lycesteria formosa*, *Choisia ternata*, *Ilex Cornuti*. Figs and Pomegranates. The *Cleyera* and *Ilex* were entirely unhurt, *Choisia* and Pomegranate partly killed back, and Figs killed to the ground. No covering of any kind was given to any of these plants, and it is probable that a little protection would have saved them all. Mrs. Dandridge speaks of the *Abelia rupestris* doing well at Washington. I may add that it thrives at Germantown. Where shrubs are grouped as at Washington and sheltered by large buildings many partly tender kinds can be easily carried through the winter. I have there seen fine *Aucubas*, English Hollies, English Laurel, *Abelias*, evergreen *Magnolias*, *Acacia Julibrissin*, and similar plants massed together, one protecting the other, and all thriving because of this protection.

Germantown, Pa.

Joseph Meehan.

Recent Publications.

The Cultivated Native Plums and Cherries. Bulletin 38, Cornell University Agricultural Experiment Station, Horticultural Division. L. H. Bailey. Pp. 1-73; 14 figures.

In his introduction to this important paper, in which are printed the results of six years of careful study, Professor Bailey tells us that "since the introduction of the Wild Goose Plum, some forty years ago, there has been a steadily growing interest in the amelioration of our native Plums." Of these at least one hundred and fifty named varieties are now recognized by pomologists; and it was the attempt to classify these and refer them to wild types which led Professor Bailey to undertake a critical study of all the Plums of probable American origin found in our gardens and orchards.

Eastern North America contains six species of true Plums which are either native to the soil or have become entirely naturalized. Of these nothing need be said now of *Prunus Alleghaniensis*, a local Pennsylvania species, or of the southern *P. umbellata*, for, although the fruit is collected from the wild trees of these species and is sold in the markets of the regions which they inhabit, they are not known to have given rise to any recognized garden varieties. Of *P. maritima*, the Beech Plum of the Atlantic coast, little, too, need be said, for only a single variety of this plant is cultivated for its fruit, and this, apparently, is of no great value, and is hardly superior to the fruit produced ordinarily by the wild plants of this species. The other cultivated Plums derived from eastern American species, or from naturalized species, Professor Bailey arranges as follows:

- a. The Americana group.
- b. The Wild Goose group.
- c. The Miner group.
- d. The Chickasaw group.
- e. The Marianna group.

In his first group the author arranges "the hardy strong-growing varieties which have come from the north-west, and which are characterized by a firm, meaty, usually compressed, dull-colored, late fruit, with thick, and usually very tough, glaucous skin, and large, more or less flattened, stone, which is often nearly, or quite, free, and by large obovate, thick, veiny, jagged dull leaves." The plants of this group are referred to the *P. Americana* of Marshall, with which Professor Bailey unites the so-called Canada Plum, which Aiton described a century ago under the name of *P. nigra*. It is true that some of the cultivated varieties which obviously belong in this group show in the herbarium characters which are intermediate between those of the wild types of the Canadian Plum and of the species of the middle, southern and western states, upon which Marshall bestowed the name of *P. Americana*; but as the two trees appear growing wild, one in the north and the other in the south, they differ so constantly in habit, in the time of flowering, in the size of the flowers, in the character and covering of the calyx-lobes, and in the form of the stone of the fruit, that it is impossible to believe that they can be specifically united from the point of view of the botanist.

In the *Americana* group forty-five varieties, now pretty generally distributed in cultivation, are described. The plants of this group are said to succeed best in the northern states of the Mississippi valley, and they are the only ones which are able to withstand the climate of the northernmost limits of the native Plum-belt, as Wisconsin, Minnesota and Iowa. There are some varieties, however, which succeed as far south as Texas, although in the Atlantic states the varieties are not grown far south.

We suspect that the varieties that succeed in the extreme north-western states will be found to have sprung from the Canadian Plum, which was brought into New England at a very early day, probably by the Indians, and where it has now become established in many places in which it is not probable that it grew naturally. It is possible, therefore, that this tree was carried by the Indians or the early voyageurs into the region beyond the Great Lakes, and that it was from these introduced plants that some of the varieties now esteemed by the pomologists of Wisconsin and Minnesota have descended. Certainly it is hard to find any trace of the *P. Americana* of Marshall in such trees as Weaver and Purple Yosemite, while in De Soto, Cheney and Forest Rose it is difficult to discover the blood of *P. nigra*.

The Wild Goose group, which is considered by Professor Bailey "the most important group of native Plums, includes varieties characterized by strong wide-spreading growth and mostly smooth twigs, a firm, juicy, bright-colored, thin-skinned fruit, which is never flattened, a clinging, turgid, comparatively small, rough stone, which is sometimes prolonged at the ends, but is never conspicuously wing-margined, and by comparatively thin and firm, shining, smooth, flat, more or less Peach-like, ovate-lanceolate or ovate long-pointed leaves, which are mostly closely and obtusely glandular-serrate, and the stalks of which are usually glandular." The species from which this group is evidently derived has only been recently recognized by botanists, and it is Professor Bailey himself, in a recent issue of this journal, who raised to specific rank, under the name of *P. hortulana*, the Plum-tree of the middle Mississippi region which earlier botanists had confounded with the Chickasaw Plum, a plant of a more southern origin.

In the *Hortulana* group Professor Bailey finds two more or less clearly marked types, one characterized by thin and very smooth Peach-like leaves, which are finely and evenly serrate, and the other by thicker, duller and more coarsely and irregularly serrate leaves. In the first of these groups is placed the Wild Goose Plum, which was first brought to notice by James Harvey, of Columbia, Tennessee. The history of this variety, which is the most popular probably of all the native Plums and the one which has done more than any other variety to extend their cultivation, is, as Professor Bailey tells it, as follows: "The Wild Goose was first brought to notice by James Harvey, of Columbia, Tennessee. Some time before 1850 a man shot a wild goose near Columbia, and on the spot where the carcass was thrown this Plum came up the following spring. It was introduced about 1852 by the late J. S. Downer, of Fairview, Kentucky. This is the first Plum introduced into general cultivation, although the Miner was first known and named." Plants of the Wild Goose type, as a whole, appear to be best suited to the middle latitudes, being grown with satisfaction from Illinois and Indiana, and the southern part of Michigan and New York to Maryland, Virginia and Tennessee, and in the south-west to Texas. The varieties which are most highly prized are Golden Beauty, Indian Chief, Missouri Apricot, Moreman, Wayland and Wild Goose.

The Miner Group, as defined by Professor Bailey, "includes a few anomalous varieties, which appear to be intermediate between *P. hortulana* and *P. Americana*. They may be an offshoot of *P. hortulana*, or it is possible that they constitute a distinct species. The Miner is particularly well marked, but there are others which it is sometimes difficult to separate from *P. hortulana*." To this group are referred Clinton, Idol, Miner and several others. It is described as a strong and hardy race, which is particularly adapted to the northern limits of the cultivation of the *Hortulana* family. The varieties are much alike. The Miner is the most popular member of the group, and it succeeds even in northern Illinois. In New York the varieties ripen from late September to late October.

The members of the Chickasaw group, derived from the so-called Chickasaw Plum, the *P. angustifolia* of Marshall, differ from the plants of the Wild Goose group "by a more slender, spreading and zigzag growth, usually smaller size of tree, red twigs, by smaller, lanceolate or oblong-lanceolate, very closely serrate shining leaves, by early small flowers, which, upon old wood, are densely clustered upon the spurs, and by an early red or rarely yellow and more or less spotted translucent fruit, the flesh of which is soft, juicy, and more or less stringy and very tightly adherent to the small, broad, roughish stone." Professor Bailey is of opinion that the type of the Chickasaw Plum grows wild from southern Delaware to Florida and westward to Kansas and Texas, although it has usually been considered an introduced plant in the eastern states, where it is generally found growing in the neighborhood of dwellings or along the borders of cultivated fields—that is, in situations to which it might have been expected to escape from gardens. Michaux, the French botanist, who resided in South Carolina toward the end of the last century, was told there that the Chickasaw Plum had been brought from the West Indies, and there are many indications which point to the southern origin of this plant, although it is fair to say, in support of Professor Bailey's theory, that it is not known anywhere outside the limits of the United States. We should suspect, from its inability to support cold and its truly domestic habits, that it had been brought into the southern states, perhaps, before the coming of Europeans from the high lands of Mexico or from some Andean region, although, if this had been the case, it is remarkable that it has never been found growing wild in those countries. It is the small-sized fruit of the wild or naturalized bushes of this species which is sold in the markets of the middle states as Mountain Cherries. Eighteen varieties of this group are described by Professor Bailey, who finds them particularly adapted to the southern states, the leading varieties being Caddo Chief, Jennie Lucas, Lone Star, Pottawattamie and Yellow Translucent.

In the Marianna group are placed the Marianna and the De Caradeuc Plums, and probably also the Hattie. These form a distinct class, "differing in habit of tree, very early flowering, elliptic-ovate, rather small and finely serrate dull leaves, glandless leaf-stalks, and soft spherical very juicy plums of a 'sugar and water' character, and broad ovate stones which are scarcely pointed and are prominently furrowed on the front edge." These plants, which have long perplexed pomologists, Professor Bailey believes are derived from *Prunus Myrobalan*, an Old World species, probably of eastern origin, although long considered by European botanists a doubtful plant, and once considered an inhabitant of the New World. It is evident, however, that it is not American, although it has been cultivated in this country for many years, especially as a stock upon which to graft the varieties of the Old World *P. domestica*, and it is doubtless from such stocks that the varieties of this group have been derived.

Professor Bailey describes and figures, too, the dwarf Cherries, which either for the beauty of their flowers or the promise of their fruit are now attracting attention among horticulturists; he explains the methods best suited for cultivating and propagating our wild Plums and Cherries; he discusses the fungal diseases which infest them, and the insects which prey upon them, and tabulates the estimates obtained from representative growers in all parts of the country of the value of the leading varieties of Plums.

Pomologists and botanists will find in this paper a mine of information, and the author has earned their thanks for cutting what he very rightly describes as "the hardest knot in American pomology." Certainly before the result of his investigations was made known no group of plants cultivated in America was so inextricably confused or so difficult to understand as the American Plums, and in future, although much additional information will, no doubt, in time be gathered about them as they are more generally appreciated and cultivated, every serious pomologist must begin his investigations

of these plants by the study of Professor Bailey's paper, which is one of the most important contributions to American garden literature which has appeared in recent years.

Notes.

A correspondent of the *American Florist* writes that Mr. Robert Craig considers Mrs. Whilldin the best early Chrysanthemum. Mr. W. K. Harris, on the contrary, thinks that Eldorado is the best market flower of the early yellow varieties.

Governor Russell, of Massachusetts, has appointed Charles Francis Adams, of Quincy, Philip A. Chase, of Lynn, and Wm. de las Casas, of Malden, members of the Metropolitan Park Commission, which is constituted to report to the next Legislature a plan for a system of ample open spaces for the cities and towns in the vicinity of Boston.

We have a note from Messrs. Thomas Meehan & Sons saying that if our correspondent quoted on page 348 had sent for all the catalogues advertised in our columns he would have found that the Prairie Rose was on sale at one establishment at least. Rosa setigera has been offered for many years by Thomas Meehan & Sons, of Germantown.

Mr. A. J. Drexel, of Philadelphia, has recently presented to the Horticultural Commissioners of the World's Fair a remarkably fine specimen of *Licuala grandis* from his private collection. The plant in question is in a sixteen-inch pot, and carries twenty-eight leaves, and is without doubt one of the finest examples of this rare Palm in the United States.

Young trees of *Robinia viscosa* have made a strong growth this year on account of the abundant rainfall, and the new shoots are now bearing a second crop of racemes of bright rose-colored flowers. This tree seems to be more popular in European gardens than it is in its native country, but its excellent habit, good foliage and attractive flowers commend it where trees of medium size are needed.

The diploma of the German Society for the advancement of horticulture has been bestowed upon Herr Kittel, of Eckersdorf, for a hybrid *Vriesea* (*V. hybrida pommer Escheana*), the offspring of *V. psittacina Morreniana* and *V. splendens*, which the judges described as superior to either of its parents, and in both habit and flower an exceptionally interesting novelty, adapted to cultivation by amateurs as well as florists.

At this season, when shrubs in flower are rare, *Cytisus nigricans* makes a very bright show with yellow pea-shaped blossoms on its erect and slender branches, which rise to the height of eighteen inches or more above the ground. It has been long cultivated in the gardens of Europe, but for some reason it is still rarely seen in America, although it is perfectly hardy and very desirable among dwarf-growing shrubs, of which we have none too many.

Baron Todaro, Professor of Botany in the University of Palermo and Director of the Botanic Garden of that city, died on the 18th of April, and has been succeeded by Dr. Hermann Rast. Todaro is known by his publications on various species of the Cotton-plant, on Agaves, Aloes and other plants cultivated in the Palermo garden. In addition to his scientific pursuits, he was a lawyer of reputation, and was actively interested in the political affairs of his country.

In the ancient days of Rome a bride always gathered with her own hands the flowers which were to form her wreath. Ordinary torches were made of Fir or Pine wood, but the torches carried in wedding processions were of the wood of the White Thorn, as this tree was sacred to Ceres and was considered a talisman against evil; and, upon entering their home, the newly married pair knelt together by the hearth and lighted their fire with one of the White Thorn torches.

The Horse-chestnut and our native Buckeyes are among the early-blooming trees, but the Dwarf Buckeye (*Æsculus parviflora*) has the advantage of blooming when shrubs in flower are not abundant. This plant, which is a native of our southern Alleghany region, attains a height of from six to eight feet, and spreads in a few years to make a bush ten feet in diameter, and from this mound of bright green foliage rise in late July hundreds of tall cream-white flower-spikes which give the shrub a most striking appearance.

"No effort to create an impossible or purely ideal landscape," says Mr. Lafcadio Hearn, "is made in the Japanese garden. Its artistic purpose is to copy faithfully the attractions of a veritable landscape, and to convey the real impression that a real landscape conveys. It is, therefore, at once a pic-

ture and a poem; perhaps even more a poem than a picture. For, as nature's scenery, in its varying aspects, affects us with sensations of joy or of solemnity, of grimness or of sweetness, of force or of peace, so must the true reflection of it in the labor of the landscape-gardener create not merely an impression of beauty, but a mood in the soul."

Former attempts to transplant Cocoanut-trees from the tropics to the greenhouses of San Francisco have been unsuccessful, but the authorities of Golden Gate Park hope for a better result with a fine specimen which recently arrived there. It came as a present from Queen Kapiolani of the Hawaiian Islands, and was the best specimen which could be procured within easy distance from the port of Honolulu, the object being to secure a fruiting tree not too tall for transportation. It is about thirty feet in height. Its branches were so carefully packed in sacking that neither the leaves nor the fruit were injured, and its roots were protected by a strong box. It was brought by horse-power from its native spot to the coast, and again from the wharf at San Francisco to the park. Great haste had to be used to prevent its being chilled by the cold Californian winds, but in three hours after its arrival at the park it was safely housed in the main gallery of the greenhouse. It is the largest example yet brought to San Francisco, but promises to live and thrive.

An article on the Great Pine of Japan, called *Dai Matsu*, which stands on the coast of the inland sea of Biroa, about three miles from Otsu, was recently published in *Gartenflora*. It says that the priests who have charge of the tree declare that it was mentioned in the records of their cloister eight hundred years ago, and that it was planted in the year A. D. 675. It is counted among the eight wonders of Japan, and its singular aspect, as it stretches its long branches far out on every side over a scaffolding formed by more than three hundred poles, has been pictured in many books of travel. Although it is fully exposed to the wind, and although its trunks and branches bear more than one lightning-scar, it is still vigorous, and only a gradual thinning-out of its foliage bears witness to its great antiquity. At two feet above the ground the diameter of its trunk is fifteen feet nine inches; its height is eighty-four feet, and the diameter of its widely-stretched crown is 242 feet. Four houses formerly stood among its branches, but two of them were ruined in a great storm a few years ago. The other two are still largely resorted to by supper-parties on summer evenings, and the Japanese take especial delight in listening to the dripping of rain into the water from the boughs as they overhang the sea. The writer of this article could not definitely ascertain to what species of Pine the famous tree belongs, but says it is possibly an example of *Pinus densiflora*, or more probably of *P. Thunbergii*.

"The art of the Japanese gardener," writes Sir Edwin Arnold, "had turned our little plot of a couple of acres into the appearance of a large and various pleasure-land, with miniature hills—from which you could see the towering snows of Fuji San—fish-ponds, rock-works, trellised arbors, and clumps of flowers and bushes, which gave us an unbroken succession of floral wealth. Scattered about the grounds were stone lamps called *Ishi dōrō*, and grotesque demons, and quaint water-cisterns in stone with Chinese inscriptions. Around these first came into bloom, defying snow and frost, the beautiful red and white and striped Camellias. When these had fallen the white and pink and rose-red Plum-flowers filled the eye with beauty. Afterward the Azaleas blazed, like burning bushes all round the Lotus-pond; and these were followed by a delicious outburst of pale, rose-tinted Cherry-blossoms, making an avenue of beauty and glory all the way from the Shinto temple at our gate to the front door, where were suspended the little, indispensable, but useless fire-engine and the bronze gong on which visitors beat with a little wooden hammer to announce their arrival. The *Wistaria* and a second crop of Camellias, and then some red and yellow roses, took up the running, and the Maple-bushes came out resplendent with blood-red leaves; after which there were purple Irises and Callas flowering by the fish-pond, with orange and red Lilies brighter than the gold-fish swimming in it, and the lawn became covered with a pretty little flower called the *Neji-bana*, the pink buds of which, growing diagonally and reaching round to get the sunlight, twisted the stem into the shape of a corkscrew. Thus, along with the sprays of the Firs and Loquats and ornamental shrubs, our gardener—whom we christened the 'Ace of Spades,' out of 'Alice through the Looking-glass,' and who wore a blue coat with white dragons upon it—was never destitute of delightful material wherewith to exercise the high art of decorating our rooms after the great æsthetic Enshin fashion."

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLES:—Foes to Country Road-sides.....	361
Botanical Nomenclature.....	362
The New Jersey Building at the Columbian Fair. (With figure.).....	362
Water-plants in Southern New Jersey.....	Mrs. Mary Treat. 363
Notes on the Flora of Smythe County, Virginia.—I.....	Anna Murray Vail. 364
NEW OR LITTLE-KNOWN PLANTS:—Richea pandanifolia. (With figure.)	W. Watson. 364
FOREIGN CORRESPONDENCE:—London Parks.....	V. C. 366
CULTURAL DEPARTMENT:—August in the Vegetable-garden,	Professor W. F. Massey. 366
The Raspberry Crop.....	E. P. Powell. 367
Notes on Shrubs.....	J. G. Jack. 367
Rose Notes.....	W. H. Taplin. 368
Some Japanese Bamboos.....	J. N. Gerard. 368
Juncus effusus spiralis, Iris tripetala.....	J. N. G. 369
THE FOREST:—The Forest as modified by Human Agency.—II.....	Colonel Bailey. 369
CORRESPONDENCE:—Orchard Spraying.....	T. H. Hoskins, M.D. 370
RECENT PUBLICATIONS.....	371
NOTES.....	372
ILLUSTRATIONS:—Richea pandanifolia, Fig. 61.....	365
Washington Headquarters, at Morristown, New Jersey, Fig. 62.....	367

Foes to Country Road-sides.

AMONG the enemies from whom the country highway needs protection the road commissioner and the electric agent are the most dangerous. The former has town authority for his vandalism, but the other marauder commits his depredations in defiance of law, and, consequently, ought to be met by organized opposition. Statutes declare that a proprietor is master of the land that abuts upon his boundaries so far as the middle of the highway, and that he has a right to its grass, its fruit, and to its possession in case the road should ever be discontinued. The town has a right to take what is necessary for the highway, and no more, to which end it may cut down trees and shrubs, plow up grass, and take other liberties at its discretion. The authorities are very apt to stretch a point in this matter, for instances are known where whole rows of stately trees have been sacrificed for the sake of a prospective road which was afterward abandoned, while all entreaties of the owners are disregarded as interfering with the town's right of eminent domain.

Another depredation is permitted also to that foe of natural grace and beauty, the road-commissioner, whose mistaken zeal is allowed annually to remove the grass which seeks to soften the dusty outline of the road along its untrodden borders and gutters. This is an expensive process and wholly unnecessary, since adding to the dust-capacity of the street is the only service it accomplishes, the short, thick turf affording no obstruction to carriage-wheels. This is called "cleaning-up" the street, when, as a matter of fact, it only adds to its dirt. But a worse phase of the cleaning-up mania is apparent when the zealous commissioner proceeds to remove from the banks of the highway what he terms weeds—namely, the graceful mantle of vegetation with which nature ever seeks to conceal the wounds which man has made. It is interesting

to watch the process by which the devastations of the road-cutter are tempered to the eye by the beautiful natural screen of vines and herbage, which, if let alone, will soon cover the rough unsightly places with a drapery of verdure when the reckless workman has left behind him a shorn and barren waste. After his inroads, banks of sand or gravel are left on either side of the wide road, from which every spear of grass has been banished, the fences stand up stiff and stark, the rocks protrude from the soil, the trees which cannot be felled have their lower branches rudely cut away, so that their trunks are gaunt and unsightly; stumps are left along the edges of the fields, and the soft turf is replaced by sandy slopes to be gullied by the rain. Without wasting an hour Nature begins her gentle but tireless work of transforming these ruins into beauty. What can be more pleasing than the unmolested edge of an old road, where Hazel and Elder hang out their fruit for the birds, where the fragrant Clethra blossoms, where the wild Grape-vine and the glossy Bramble climb from tree to tree, and wild Roses and Morning-glories brighten the shadows with their smiles. Here in the spring the Trientalis and Anemone make the ground beautiful with their white blossoms, while the Shad-bush waves a welcome to the passer-by. As summer comes the sky-blue Chicory clusters there, the Milkweed and the Epilobium show pink and purple amid the foliage, the Mullein lifts its stately yellow blossom from its furry leaves, while the Barberry shows first its arcs of yellow bloom and later its coral clusters of fruit, that contrast well with the great Golden-rod and the splendid purple of the wild Aster in the fall.

The leafage is dense and varied. Sweet Fern and Bayberry add to its fragrance with their aromatic odors; the Alder waves its tassels; the Swamp Willow lifts its lance-shaped leaves after the catkins are gone; now and then there is a whiff of fragrance from an Azalea which gladdens the hot breezes of July from a neighboring swamp; Ferns and young Pines struggle together in their infancy, and here and there a feathery Hemlock rises under the protecting shade of other trees, where it loves to hide from the sunlight.

The panorama, as you drive or walk, perpetually changes, reveals new charms, hidden beauties, in a wealth that a gardener might envy. Everything, from a Buttercup to an Orchid, may be found along the highway border, while the thrushes and the song sparrow call among the bushes, and the saucy squirrel scolds from the bending boughs above.

All this is scorned by the thrifty farmer as a nursery of weeds and disease for his crops, and nominally in his interest the mower walks abroad with his brush-hook and makes havoc of this charming scene which we enjoy. But who shall excuse the hireling who, in the interests of electric-lights, climbs our trees with spiked shoes that tear holes in the bark, hews away great limbs, leaving the stumps to absorb moisture and decay into the very heart of the old Elm or Maple, or, worse still, places his wire so carelessly that it is found burning the boughs away, so that they fall with a crash, to the peril of the incautious foot-passenger.

From such depredations as these it seems as if there must be some legal defense. It is useless to remonstrate with the men with anything gentler than a shot-gun, and it seems sometimes as if its use upon such wanton trespassers would be almost justifiable, so insolent and unheeding do they become in their irresponsible onslaughts upon private property.

Sooner or later there must be some legal issue made upon this matter if we are to preserve from mutilation and destruction our fine avenues of trees which now suffer at the hands of these electric depredators, who certainly have no authority for wholesale damage to the trees which may interfere with their lines. It would be well enough if they and the Road Commission would show their zeal in the destruction of such trees as are breeding-places of black-knot and other diseases, or which harbor

the curculio. Herbaceous plants, too, which are pestilent weeds, and spread by seed into adjacent fields, ought to be destroyed. But no discrimination is made. Lilies and Columbines and Clematis fall with the Canada Thistle, and a warty Wild Cherry is quite as safe as a Tulip Poplar. If half the zeal were displayed in a persistent warfare against the real pests of forest and farm as is now exercised against the beautiful growth along country way-sides, injurious insects and infectious fungi would soon be less abundant and destructive.

Botanical Nomenclature.

WE have received a circular containing the suggestions of a committee composed of the following well-known German botanists, Ascherson, Engler, Schumann and Urban, appointed to amend the laws of botanical nomenclature as adopted at the Paris Conference of 1867. The committee proposes the following changes:

First, that the starting-point of the priority of genera, as well as species, shall be 1753, the date of the publication of the first edition of Linnæus' *Species*, instead of 1737, the date of the publication of the first edition of his *Genera*.

Secondly, that nomina nuda and seminuda shall be rejected, pictures alone without diagnoses not being allowed any claim of priority.

Thirdly, that similar names shall be preserved if they differ by ever so little in the last syllable, although if they only differ in the mode of spelling the newer one is to be abandoned.

Fourthly, the names of certain large and universally known genera, a list of which is added to the report, are to be preserved, although if the strict rules of priority were followed they would be rejected.

The committee states, as a reason for abandoning the first edition of the *Genera* of Linnæus as the authority for genera, that "the turning-point from the ancient botany to our modern science rests in the introduction of the binomial nomenclature, as previously to the publication of the *Species Plantarum* (1753), which followed a year after the fourth edition of the *Genera*, the scientific position of Linnæus was not superior to that of Tournefort, Rivinus and many other botanists who often had described and segregated the genera more exactly than he did."

With reference to their second change the committee say: "Many genera have been founded on a picture only without a diagnosis. No doubt, by means of it a species sometimes can clearly be made out and recognized, and if the picture is a good one all the characteristics of the plant can be observed. But a picture can never show the special characteristics alone which raise the genus above the other of its affinity. A genus only gains priority by a verbal diagnosis, and nomina nuda and seminuda are to be rejected; therefore the following works cannot claim a right of priority: Rumphius, *Herbarium Amboinense*, Burmann, *Flora Indica*, Patrick Browne, *History of Jamaica*, Lamarck, *Illustration des genres pro parte*, etc."

As illustrating the meaning of Article iii. the committee would preserve *Adenia* as well as *Adenium*, *Chloris* as well as *Chloræa* and *Chlora*, *Atropa* as well as *Atropis*, while such cases as *Epidendrum* and *Epidendron*, *Oxycoccus* and *Oxycoccos*, are held to be only different modes of spelling the same word, and the newer one is to be abandoned if they relate to different genera.

The provisions of Article iv., as proposed, are more radical, and will give rise, probably, to more criticism than the others. In their explanatory note the committee state that "the impulse that led to the acknowledgment of the right of priority was only the vivid desire to create a stable nomenclature. If we see that by the absolute and unlimited observance of the principle we probably gain the contrary of what we intended; we, who have ourselves made the rules of priority as a law, have the right to amend the latter. Therefore we present a list of genera that have more than a merely scientific interest or that are very large,

and we propose to conserve them in spite of the rules of priority, in order to avoid a general confusion by the change of many thousand names." They then give a list of seventy-eight genera for which they would propose to preserve names which are not the oldest. Among these some of the most interesting to American botanists are *Malvastrum* (1849) in place of *Malveopsis* (1844), *Oxytropis* (1812) for *Spiesia* (1790), *Desmodium* (1813) for *Meibomia* (1763), *Liatris* (1791) for *Laciniaria* (1762), *Mikania* (1803) for *Willoughbya* (1790), *Statice* (1807) for *Limonium* (1759), *Dendrobium* (1799) for *Callista* (1790).

The first article seems to us unimportant, although, as all modern nomenclature rests upon the system of Linnæus and dates from the publication of his *Genera* and *Species*, we should prefer to go back to the first edition of the *Genera*, although it was published before his binomial system was perfected and before he had established his supremacy over all his rivals.

Of the wisdom of the second clause there can be no question, as no theory of nomenclature can stand which is based only on the use of names unsupported by published diagnoses, although we confess we do not understand the wisdom of excluding Browne's *History of Jamaica*, as his diagnostic characters supported by figures rarely leave any doubt as to the species or wish to record.

Article iii. will certainly be approved by working naturalists; but whether the great majority of these adopt the fourth article and consent to an arbitrary selection of certain names, these names being taken contrary to a well-established rule and simply for convenience, seems to us doubtful. If all naturalists could be induced to agree to call *Malveopsis* *Malvastrum* or *Spiesia* *Oxytropis*, because these names are more familiar to the present generation and their retention would save labor and confusion, and if not only the present generation of naturalists, but their successors for all time, could be bound to adopt these names, then the plan would be an admirable one. But, unfortunately, the only way to make nomenclature really stable is by an unflinching adherence to a rule. If one exception is admitted another will be, and as long as the human mind is active there will be botanists who will think that they can secure notoriety for themselves by changing names and by making other deviations. To prevent this and to make nomenclature stable, it seems to us that the law of priority must be maintained at any cost of labor and inconvenience, and that the longer its adoption is postponed by makeshifts like the one here suggested and by efforts to avoid meeting the issue squarely, the greater will be the ultimate confusion, and we deplore any effort to postpone changes of names which, sooner or later, are sure to be made, and every attempt to avoid compliance with the fundamental law on which scientific nomenclature is based.

The whole subject, however, is one which demands careful consideration and discussion as well as the co-operation of working naturalists in all parts of the world; and their contemporaries will be grateful, whether they agree with their recommendations or not, for the thought and labor the members of this committee have bestowed upon this most difficult and perplexing subject.

The New Jersey Building at the Columbian Fair.

FOLLOWING the example set at the Philadelphia Centennial, the various states of the Union will have houses of their own on the grounds of the Columbian Exposition at Chicago. Of course, the attractiveness of the portion of the grounds devoted to these buildings will depend on the taste shown in their design. The most prominent of all these structures, the one belonging to the state of Illinois, does not seem to us worthy of the fine position it occupies, while the New York State building, which is to be in the style of an Italian villa, seems very appropriate to the use for which it is intended, and, judging from drawings, it will be a work of great beauty. The

commissioners for New Jersey have done wisely in selecting as the model of their club-house the old Washington Headquarters at Morristown, which is the most famous house in the state and one of the most famous historical houses in the Union, not only because more persons distinguished in the military history of the Revolution have been gathered under its roof than under any other roof in America, but because it is an excellent example of the architecture of the time when it was built, and because it has been kept in such an admirable state of preservation. It is rather unusual, too, in America, for a house to remain continuously in the possession of one family so long as this one did, for the deed which conveyed the building to the trustees of the state was given by the seventh generation, counting from the honored mother of Colonel Jacob Ford, who owned the building when it was occupied by Washington.

The original house seems good for another hundred years at least, and the same oaken planks, caulked like the shell of a frigate, remain on the outer walls as sound to-day as when they sheltered Washington from the storms of the winter of 1779 and 1780. The old floors are still firm; the double oaken doors, which opened and shut for Washington, open and shut to-day, and there has been hardly any change or repair or restoration in the house from bottom to top. The same surbases, windows, mantel-pieces, fire-places, hearth-stones, and the same carving on the lintel and cornice remain just as they came from the hands of the artisan. The house, too, with its wide hall and spacious rooms, will be cool and well adapted to the purpose for which it is intended. Let us hope that all the details of the building will be accurately copied, so that it will be a genuine reproduction and not a parody. Of course, one thing cannot be repeated, and that is the surroundings of the old house at Morristown. One charm of the place is the perfect adaptation of the house to the rich landscapes which stretch away from it on every hand. One change is said to be contemplated, but this will not be ruinous, and that is the addition of an extension similar to the one seen in the right of the picture, on page 367, on the opposite end of the house. This would be after the symmetrical style of southern colonial houses, and would, probably, be what Colonel Ford would have done if he had ever enlarged his residence. Nevertheless, if the building, as it now is, offers room enough for the accommodation of New Jersey at the fair, no change whatever in the model should be permitted.

Water-plants in Southern New Jersey.

VERY attractive are the ponds in the Pines at this season, with the plants which float upon their surfaces or bloom above them or riot in the swampy ground about their margins. The sweet-scented Water-lily (*Nymphæa odorata*), with its singular grace of form, purity of color and exquisite fragrance, must ever remain the queen of wild water-flowers. These plants are attractive anywhere, but they are never so charming as they are in some lonely wood-bordered lakelet. No doubt, the cultivators who make artificial basins for growing them enjoy their loneliness, and this is the only way most people are permitted to enjoy them. But a Tank-lily can never be a Pond-lily, after all. Varying forms of the yellow Pond-lily (*Nuphar*) are here, too, some with yellow flowers, others quite purple. The flower is interesting and curious, with its many-rayed stigma and numerous small petals crowded among the stamens under the ovary, a snug retreat, where small insects seem to find something to their liking.

Another plant belonging to the Water-lily family is the peculiar *Brasenia peltata*, or Water-shield, which is scattered in thick patches over the ponds. Its long-stemmed, shield-shaped leaves float gracefully on the water and bear clusters of small purple flowers in their axils. The stems and flower-buds are coated with a clear, limpid jelly, and when held in the sunlight they sparkle like plants covered with ice after a winter's sleet. The Floating Heart (*Limnathemum lacunosum*) is another plant quite common in the ponds. It has smooth, shining, small heart-shaped leaves, often beautifully

mottled with white, and pretty clusters of small white flowers. It belongs to the Gentian family, and continues in bloom throughout the summer. The large velvety leaves of the Golden-club (*Orontium aquaticum*) are also floating on the water, and the greenish-looking seeds are falling from the spadix and scattered along the edge of the pond.

The narrow-leaved Cat-tail, *Typha angustifolia*, as well as the more common *T. latifolia*, left its spears above the marshes in a delightfully decorative way. The narrow-leaved *Typha* is specially pretty and delicate, with its slender, dense, brown spikes of flowers. And *Sagittaria*, with its many forms, well named from its arrow-shaped leaves, is not to be despised. The flowers are pure white, and some of them are quite large and handsome, although they look so frail, with their almost transparent petals. They keep in bloom all summer long. The blue flowers of the Pickerel-weed (*Pontederia cordata*) contrast well with the *Sagittaria*, and were it not for the ephemeral character of the flowers, which gives the spike a ragged appearance, they would look charmingly together, as they both continue in bloom well into October.

The button-like dull white flowers of *Eriocaulon*, or Pipe-wort, stand well up out of the water on their straight, slender, naked scapes, while their loose, cellular, grass-like leaves are entirely submerged. Two or three species of Yellow-eyed Grass (*Xyris*) are in company with *Eriocaulon*. The slender, rigid, compact leaves and scapes of the first are quite in contrast with the loose cellular structure of the other. The flowers of *Xyris* are small and yellow, and produced all summer from rigid scale-like heads. The leaves and scapes of some of the species are curiously contorted and twisted, especially in those of *X. torta*.

Several species of the perplexing Bladderwort (*Utricularia*) are floating on the water, eluding all of my efforts to learn the cause of the merciless slaughter of the little aquatic animals around them. *U. clandestina*, perhaps, causes more ruin among the tiny inhabitants of the pond than either of the other species. Its submerged leaves and stems are thickly studded with curious bladder-like traps, ready to capture the unwary creatures which venture near enough to touch the marvelous door which suddenly opens and draws them in and quickly closes, never to be opened from the inside to let a victim escape. Great numbers of the larvæ of the chironomus-fly and of the mosquito, and many entomoscans are alike made prisoners in their chambers of death.

The inflated Bladderwort (*U. inflata*) is the most elegant species in the genus. It floats on the water easily and gracefully at the will of the wind, with erect stems surmounted with large yellow flowers. In the place of roots is a whorl of white inflated bladder-like stems, each an inch or two in length, which keep the plant afloat and right side up. Below the inflated stems are finely dissected leaves containing many little bladders with the same structure as those of *U. clandestina*, but, as far as I have observed, this species entraps very few creatures. Another handsome species is the Purple Bladderwort (*U. purpurea*). This also floats on the water, but in thick tangled masses, from which arise many flower-scapes with rather large purple blossoms. This species bears more bladders than either of the others, and under a low power of the microscope they are beautiful objects. Their construction is quite unlike those which belong to the yellow-flowering species.

Great masses of *Drosera longifolia* are growing in the more shallow places, with long stems raising the leaves and flowers out of the water. In some places they are as thick as they can well stand over quite a large space. They are beautiful plants glistening in the sunshine like jewels. But they, too, are death-traps, and destroy the lives of many creatures of the air, that seem to be attracted by sticky fluid that exudes from the glands and sparkles on their leaves. When a fly alights upon a leaf it is held fast, and many of the leaves are found folded entirely around their victims.

Another species, *D. filiformis*, is here too, growing in wet sand; this has long, thread-like leaves, ten to twelve inches in length, covered from base to summit with reddish glands like those of *D. longifolia*. The scape is a foot or so in height, bearing handsome rose-colored flowers which last through July and August. This species captures many insects, butterflies and moths and large *Asilus* flies, and many others. When an insect alights and finds itself fast, it is natural for it to reach out and grasp other leaves, and so it becomes more and more entangled among them, until escape is impossible. The handsome Pitcher-plant also grows here, and looking within its curiously constructed cup we find here, too, many captured insects.

Vineland, N. J.

Mary Treat.

Notes on the Flora of Smythe County, Virginia.—I.

THE mountains of south-western Virginia have been so often and so thoroughly explored and botanized over that it would seem that nothing new could be found there, and that anything written about their flora would be an altogether too oft-told tale. The reality was, however, always fresh, and every new excursion through sometimes almost untrodden forests and up to mountain-summits reveal, if not new plants, at least those that, either by their beauty, great luxuriance or curious structure, never failed to interest the collector. Marion, in the neighborhood of which most of our botanizing was done, lies in the heart of Smythe County, on the Middle Fork of the Holston River, about twenty-eight miles, as the crow flies, from the boundary-line of North Carolina. It is a small straggling village on a slope at an altitude, they say, of 2,300 feet, surrounded in every direction by innumerable little foot-hills, called by the natives knobs. Most curious little hills they are, molded and furrowed and worn into all sorts of whimsical shapes. There are round hills, pointed hills, symmetrical hills; hills that have gentle slopes, hills that are too steep for the most ambitious tobogganist, and hills that have no shape whatever. Beyond them to the south, in the Blue Ridge, rises the long, scarcely broken range of the Iron Mountain, and still beyond, in the same system, the two high peaks, White-top and Mount Roger, the latter familiarly known as Balsam Mountain, for the names of the United States Topographical Survey maps are not by any means the local names. North of Marion the long, straight, almost plateau-like level of Walker Mountain completely shuts out any view into the broad valley of the North Fork of the Holston River beyond. All the mountain-tops are densely wooded, with small scattered farms with Rye and Corn fields on the lower ridges, and in the fertile valleys many an acre of rippling Wheat-fields.

The Holston at Marion is rather more than a brook, something less than a river, and it flows between high banks that gradually, a mile or so below the village, become so steep and rocky as to make it practically inaccessible except at certain intervals. The river tosses and foams between Moss and Fern fringed cliffs and dense and fragrant woods of *Arborvitæ* and Hemlock. The latter were all large, fine trees, and the *Arborvitæ* giants of their race. One of the largest of the latter measured nearly fifteen feet in circumference, and many were more than half that size. For a month or more we botanized at intervals along the river-banks, and the succession of plants was most interesting.

Toward the latter part of May the flowering trees and shrubs were numerous. Some superb Wild Black Cherry-trees were in bloom in the woods and along the roads. Many of them were large trees, and were beautiful objects while their flowers lasted. Redbud was in its glory, and both Dogwoods, *Cornus florida* and *C. alternifolia*, were in bloom at the same time, and side by side in great clumps. The Sugar-berry (*Celtis occidentalis*) was just dropping its flowers, but the pretty Bladder-nut (*Staphylea trifolia*) was still hanging out its graceful, drooping white bells. Rather smaller than this was the Nine-bark (*Physocarpus opulifolius*), a most effective *Spiræa*-like shrub, and *Barberis Canadensis*. The Barberry we found was fairly widespread all through the county on dry hill-sides as well as on the river-banks, though nowhere in any great quantity. Its yellow drooping racemes are very pretty, and altogether it is a neat little shrub. The clefts of every rocky ridge were filled with great bunches of *Hepatica acutiloba*, then in fruit, and quite close to the village one of the cliffs was covered with a mass of *Polypodium incanum* growing on the edge of and in the seams of the rocks. With it were the Cliff-brake (*Peltæa atropurpurea*), a light green, somewhat silvery-looking, Fern, and two *Aspleniums* (*A. parvulum* and *A. Rutamuraria*), the latter with fronds nearly three inches long. At the base of the rocks and through the woods was the pretty *Oxalis recurva*. It is a handsome plant, quite erect, and over a foot tall, the golden yellow flowers being in many instances nearly an inch across, and the leaves very striking, with their bright brown margins. In the swampy borders of the river *Phacelia Purshii* was abundant, a beautiful species, with a rather straggling habit and delicate light blue-fringed corollas.

Violets have a more or less prominent place everywhere during the month of May, and in the vicinity of Marion their profusion and luxuriance of growth was most surprising. In all we collected thirteen species in the valley and on the hills, all, with the exception of the little yellow one, *Viola rotundifolia*, blooming at the same time. With the *Phacelia* on the river-bank was *Viola striata*, over a foot tall, with large creamy white flowers, and *V. rostrata*, smaller, with flowers of two

shades of lilac-purple. The latter was by no means rare, and could be seen all through the swampy woods and often in open fields, where it did not reach three inches in height. The near relative of the Violets, *Solea concolor*, a coarse herb with inconspicuous little greenish flowers, grew with the white Violet on the river-bank.

The only Iris we found in the region was *I. cristata*, a lovely light bluish flower with yellow crests, on wooded hill-sides, growing in great beds. Many of the shrubs were overgrown with an impassable tangle of Cat-briers, prominent among which was *Smilax hispida*. *Dioscorea villosa* and *Smilax herbacea* were in such close proximity that it was hard to say where one ended and the other began. The curious Leather-flower (*Clematis Viorna*) was found trailing on hot, dry hill-sides on the ground, the flowers standing up straight from the vines. They are more than an inch long and of a delicate reddish purple. One of the most striking among the smaller plants on the river-bank was the light violet-blue *Cedronella cordata*. Higher in the mountains and in more sheltered situations its flowers were of a delicate pink. During the last week in May, as soon as the Red-bud flowers were over, the Locusts (*Robinia Pseudacacia*) began to bloom, and lasted in the valleys for over ten days. The village streets and the fields and woods were full of their sweet fragrance. In the deepest and gloomiest part of the Holston ravine grew the Twin-leaf (*Jeffersonia diphylla*). It was in fruit when we found it, but was none the less interesting, as the pear-shaped pod with its little cone-shaped lid and bright orange-brown seeds was very quaint. The Barren Strawberry (*Waldsteinia fragarioides*) was found in a little isolated bed under one of the big Hemlocks, and with it was the bright rose-purple *Polygala pauciflora*, a charming little plant, by no means uncommon in the mountain-region.

Great cliffs were covered with long pendent masses of the Bladder Fern (*Cystopteris bulbifera*), and some of the rocks were so covered with mats of the Walking-leaf (*Camptosorus rhizophyllus*) as to be completely hidden.

In a shady nook was quite a dense growth of the plants of *Aconitum uncinatum*, and with them the straggling *Polemonium reptans*, with blue-purple nodding flowers. *Spiranthes latifolia*, the prettiest of the North American Ladies' Tresses, was growing on the edge of the water, almost in the river, and near it the queer little green spike of another Orchid, *Habenaria bracteata*. The Leatherwood and the Spice-bush (*Lindera Benzoin*) were both beginning to fruit in the densest portion of the wood, and the silky Cornel or Kinnikinnick (*Cornus sericea*) was just opening its flowers on a little island in the river.

New York.

Anna Murray Vail.

New or Little-known Plants.

Richea pandanifolia.

THIS very remarkable Tasmanian plant, of which living examples are now in cultivation at Kew, is figured and described in Hooker's *Flora of Tasmania*, where it is said to grow in the dense mountain forests in the interior of the southern and western parts of the colony, presenting a more striking appearance than any other Tasmanian plant, its long, naked, slender annulate stems attaining a height of thirty-six feet, and bearing one or several huge crowns of long waving leaves, often rising far above the surrounding vegetation, and strikingly resembling in general aspect the mountain Pandani of India. The trunk is nine inches in diameter, with a large pith, sometimes branching with a crowded head of rigid coriaceous leaves, each from three to five feet long, shining green sheathing at the base, tapering to a long point, the margins finely serrated. The flowers, which are small, are produced on a compound axillary panicle six inches long. The appearance of the plant certainly suggests an endogen, such as *Bromelia* or *Pandanus*, rather than the exogenous order *Epacridaceæ*, to which *Richea* really belongs, its nearest affinity being the well-known genera *Sprengelia* and *Dracophyllum*. The Kew plants were raised from seeds collected by Mr. Justice Dobson, of Hobart, in 1882, from whose letter to Sir Joseph Hooker I am permitted to make the following extract relating to the *Richea*. He wrote: "To get these seeds I made an expedition to the head of the Lachlan River, which falls into the Derwent,

close by New Norfolk. The only route is up the bed of the Lachlan. The sides of the hills are most precipitous, and the bed of the river is a mass of dead timber, rocks, boulders, waterfalls and everything else that can make traveling difficult. After ascending 2,500 feet we got to

seed. Sphagnum grew abundantly about these giants, who seem to love plenty of moisture at their roots and to enjoy a rotten, peaty soil."

The Kew examples of *R. pandanifolia*, which are now ten years old (see illustration on this page), are two feet high



Fig. 61.—*Richea pandanifolia*.—See page 364.

the top of the tier, a marshy, scrubby plateau, where, after struggling through *Baueria*, *Fagus Cunninghamii*, *Leptospermum* and cutting grass, I saw the first giant *Richea*. There were about forty trees, and most of them were in flower, but as the old flower-stalks and seed-vessels continue adherent to the tree, I succeeded in finding good

and have leaves nearly two feet long. Judging by the behavior of these plants, a full-grown specimen must be many years old. They are evidently not difficult to manage in cultivation, and so far they have proved just as happy in a hot moist stove as in an airy greenhouse. They grow well in sandy peat, and like a liberal supply of

water at all times. Apart from their exceptional botanical interest, they are quite as ornamental in appearance as some Pandani and Cordylines.

There are eighteen species of *Richea*, all natives of the mountains of Tasmania and south-eastern Australia. Some of them are small and bush-like, with leaves only an inch or so in length. *R. dracophylla* grows to a height of twelve feet, and has flexuose leaves two feet long. I am not aware that any other species of *Richea* is in cultivation in Europe except the one here figured, with the introduction of which Kew is to be credited.

London.

W. Watson.

Foreign Correspondence.

London Parks.

EVERY year more open spaces are provided in England for pleasure-grounds, and those most recently acquired are largely planted with hardy flowers in bold groups or with masses of annuals which are in their respective seasons gay with color. The shrubs in these places, however, are not so satisfactory. They are mostly crowded together so that they die from strangulation or starvation, or at least they make no characteristic or healthy growth. Horticulturists fond of brilliant effects will be pleased with the bedding in Hyde Park, from Rotten Row to the Marble Arch, the ground running along the Park Lane being now a blaze of Fuchsias particularly, although other flowers, such as Tuberous Begonias, are used freely.

For a few years past the Fuchsia has been a great favorite here for bedding, and in such large masses as can be seen in Hyde Park the effect is most pleasing. For the most part the fine old-fashioned kinds that have been almost lost sight of since the flower has been out of fashion are to be seen in the public parks. One of the most popular kinds is the Earl of Beaconsfield, the flowers of which are tubular and scarlet. Other varieties preferred are Annette, distinguished for its massive green leaves and purple-crimson flowers, the Empress of Germany, with violet, blue and crimson flowers, Tower of London, Madame Cornellesin and Elizabeth Marshall. The plants are about three feet high and are grouped in threes, usually of distinct kinds, on the turf, so that the lower shoots touch the closely trimmed grass and the little shrubs are each one a pyramid of bloom. The great point in dealing with such tender plants as the Fuchsia is to let them make as much of their growth as possible in the open air so that they become thoroughly well-hardened to endure the trials of summer weather and maintain a display of flowers until frost.

Of course, in large places, size counts for something, and besides the large specimens of Fuchsias are admirable groups of *Erythrina Crista-galli*, *Pelargonium*, *Madame Crousse*, a fine ivy-leaved variety with salmon-pink flowers, and *Clematis Jackmanni*. The Tuberous Begonia has done much to displace the beds of *Pelargoniums* in the English parks. As far as possible the colors are kept distinct so as to gain a full and strong effect. It is possible now to purchase seeds in distinct shades, and they produce flowers true to these tones, while in regard to size and habit there has been a great advance in the outdoor Begonias, whose flowers have great breadth, stand well up above the foliage and seem to be proof against the vicissitudes of weather. A moist season suits them best, and while the *Pelargoniums* have run to leaf the Begonias have been smothered with bloom.

The tufted Pansy is another plant much used in the parks as an edging, as a groundwork to taller things, and in beds by itself. The important point with these is to select varieties of good color, and there is no kind more generally used than Archie Grant, which has bold flowers of deep royal blue, which never lose their character throughout the year. These Pansies are a charming group, which now range through many colors, from white to the deepest

purple. They commence to bloom in spring and continue to the end of summer, disliking only severe drought.

It is surprising what may be accomplished in outdoor gardening even in London, one of the smokiest cities of the world. One of the most successful plants used here is the Carnation, which is planted very freely. The old Clove succeeds remarkably well, and forms large clumps. Americans when visiting England should not forget the parks and city gardens, which are worth seeing all the year. In the spring months the bulbous flowers are used freely. Last spring the beds now occupied by the Fuchsias in Hyde Park were filled with the best kind of Daffodils—that is, those with the earliest flowers, like the Maximus, Horsfieldi or Empress type, while the Poet's Narcissus followed later in the season.

Chiswick, England.

V. C.

Cultural Department.

August in the Vegetable-garden.

THOSE who enjoy a sweet, quickly grown turnip should sow now a few of the Extra Early Milan. I say a few, because those sown now will be overgrown and pithy before cold weather, and successive crops should be sown to follow the first. Here, in the south, we can sow this variety as late as October and grow a fine crop, the last sown usually being best of all. The Extra Early Milan grows almost as quickly as a Radish, and when the size of an ordinary biscuit is a delicious table-turnip; but sowings should be continued to have it in the best condition, and in the latitude of New York seed can be sown in rich ground as late as early September. For a turnip to keep in winter, we like the variety known here as Southern Prize. It is not catalogued by northern seedsmen, but can be had of seedsmen from Richmond southward. Robertson's Golden Bull is another good variety for winter use. Both of these require a longer season than the strap-leaf sorts like the Milan, and should be sowed at once.

In the latitude of New York the winter crop of Celery is now in its final quarters, and the only thing to do is to keep it free from weeds. Do not handle or cultivate Celery when wet with dew or rain.

Plants of Brussels Sprouts can be set now in the latitude of New York in moist and rich land. This vegetable is too rarely grown in this country, partly, I suppose, because it will not stand out in the north, and it is not in good condition until touched by frost. But Brussels Sprouts may be stored like Cabbage, and in the south they ought to supplant the coarser Collard, for here they can be left to stand during the winter. If our northern friends, for any reason, have failed to set their winter Cabbage-plants at the proper time for them—in early July—let them get now, if possible, plants of the Winningstadt Cabbage, and they will still make good heads.

In most localities seed of the Barletta, or the Queen Onion, sown early in August, will make a fine crop of beautiful little pickling onions. In the south, the main garden crop of August is the late Potato-crop from seed of the early crop. We bed our early potatoes in the open ground and cover lightly as soon as dug, and in August take up and plant those that are sprouted, and no others. This crop is becoming of great importance in the south, as we find that these late potatoes are vastly superior for spring planting to any we can buy at the north, and, from the fact that they can be kept unshriveled until July, they will be of great value as a food-crop in late spring. Northern gardeners are now finding it to their advantage to get these late-grown potatoes for planting them in spring, and quite a trade is springing up in seed-potatoes from the south.

Broccoli, for fall use, should now be set in northern localities, where it does well. This is Cauliflower under another name, and usually takes the place of Cauliflower in autumn. About Baltimore the gardeners call the green-curled Scotch Kale Broccoli, and they set it out at this season just as they do late Cabbage. It makes a fine vegetable after frost, and is so hardy that it can be left out almost anywhere. When grown in this way it is much better than that sown later and cut small for "greens."

Try a crop of Peas early in August. Sow them in a trench and cover lightly, and work the soil into them as they grow. If they escape the mildew, they will give a very acceptable autumn dish. The best sorts to sow now are Premium Gem and Chelsea. A dusting with flowers of sulphur is good as a preventive of mildew.

If Carrots are relished in winter, sow now some seed of

Early Horn variety. They grow quickly. Eclipse Beets sown now will be better for winter use than the long ones usually sown earlier.

Late in the month of August sow seed of Chinese Rose-colored Winter Radish. We have tested all the varieties of winter Radish, and are of the opinion that this is the only one worth growing. Successive sowings should be made into September, as the first may grow pithy. Here we can sow them until middle of October.

From Maryland southward long cuttings of Sweet-potato vines made early in August, say a yard long, and wrapped in a coil, putting the whole in a well-watered hill except the tip, will make a great crop of small tubers, which will keep better in winter than the potatoes from the spring setting, and make the best seed for next spring's bedding. In the Carolinas and southward the best potatoes for winter table use are grown from these cuttings.

Raleigh, N. C.

W. F. Massey.

The winter made matters worse; and now our bushes are practically old and worn out, instead of being virile and young.

The remedy must, of course, be suited to the disease. Our fields must be arranged to defy drought as far as possible. This can be done by thorough cultivation in the spring, by mulching, and by growing the canes five feet or more in height, thus shading the soil more effectually between. But it is not impossible or seriously expensive for many of us to arrange a system of irrigation. In any event, there must be a prompt removal of fall blossoms, if these are abundant. The canes must in no way be devitalized before winter—that is, we must get strong canes, and keep them strong. I have never seen poorer than those prepared in 1891 for 1892; and the result is an inferior crop. Of course, a good deal can be done by high manuring. It must also be borne in mind that different varieties of berries demand different methods of culture. The Turner must be grown in hills, to give any fruit worth mentioning; while the Cuthbert does best when grown in



Fig. 62.—Washington Headquarters, at Morristown, New Jersey.—See page 362.

The Raspberry Crop.

THE Raspberry crop of 1892, after all, is a failure. The fruit is inferior, and the quantity produced about one-fifth what it should have been. The case is one full of interest and worthy of study by horticulturists. If the fruit as brought into market is examined, it will be seen that it is rusty or has a whitish appearance. The berries are not filled out well, and are not large or succulent. At the opening of the season the bearing canes looked as exhausted as they generally do near the close of the picking season. In the spring these canes were found to be killed back one-third, and were enfeebled. The severity of the winter was not enough to account for this. The second crop, borne last October, was my first reason for the exhausted bushes. But, perhaps, the cause lies still further back. The year 1891 was extraordinarily dry in the growing season. The canes were few, and short and slim. The lack of vitality and badly formed cells led to an effort to bear fruit, exactly as girdling an Apple-tree makes it at once a bountiful bearer. So our weak canes pushed out an autumn crop, a useless fruitage. This still further weakened them.

close rows with tops interlocking, and the whole ground shaded. What is true of the raspberry crop is also true of most other fruits, when the prolonged dry weather of last year was most marked. The cherry and plum crops fail, and pears, while blossoming profusely, have not set fruit. This result may occur from numerous causes, but I am confident, from examination, that the chief cause for the failure this year is the enfeebled growth of last year. It is agreeable to look forward to 1893 with a certainty that fruit will be admirably provided for, so far as abundant and vigorous growth is concerned. The Raspberry-canecan are abundant and are strong. Such growth will not encourage premature fruit-bearing in the fall.

Clinton, N. Y.

E. P. Powell.

Notes on Shrubs.

DURING the last two weeks, or the second and third weeks in July, the objects of most comment and greatest popular interest and admiration by visitors to Franklin Park, in Boston, have been the knolls, banks and other bits of ground covered with dense masses of *Rosa Wichuraiana* in full bloom.

At a little distance the ground sometimes seemed so thickly covered with the white flowers as to almost give the effect of snow, while a nearer view showed innumerable clusters of single white Roses of good size with yellow stamens, and well set off by a thick covering of handsome immaculate dark green foliage over the ground beneath. The fragrance given off is not that of most wild Roses, but more nearly suggests the Banksian Rose of our greenhouses, although it is sweeter and without a certain disagreeable quality of the Banksian. Bees of various kinds, but especially honey-bees, were present in large numbers about the abundant bloom.

In the two or three years since it has been planted in this park, *R. Wichuraiana* has shown a wonderful capacity for growth and for covering the ground almost to the complete exclusion of any other form of low-growing vegetation. It has been planted in Franklin Park in various situations—among other shrubbery, by itself in masses, on knolls and on rocky banks—and in any of these situations it appears to thrive equally well. In some places where it was planted with double-flowering Blackberries, dwarf *Spiræas* and similar plants, its rampant stems have largely overgrown them, so that they seem to be fast getting crowded out. Some *Rhododendrons*, planted in an inappropriate and artificial situation, are becoming partly hidden in the wild growth of this Rose, which was planted as a ground covering beneath. As a rule, the stems of the Rose trail closely along the ground, but the new stems of each succeeding year grow over the preceding ones, and where the tips get a chance to climb through the branches of some other shrub they take advantage of the support and become more or less raised. In fact, its habit is more like that of a trailing Blackberry or Dewberry than any other familiar object. Considering that its importation was undesigned or without a knowledge of its peculiar habit or value, the introduction of this Rose has proved a very fortunate circumstance. Its dark, shining, evergreen-looking foliage will form a splendid covering for any rough piece of ground, and sandy or gravelly areas are likely to prove very congenial to the growth of the plant. It is now (July 26th) still in good showy bloom, but a week or ten days ago was in its very best condition.

Our own Michigan or Prairie Rose (*R. setigera*) is the contemporary of *R. Wichuraiana* in its season of blooming, but its direct opposite in the color of its abundant deep rose-colored flowers, which form a most striking contrast and make a bold show. Left to grow in its own natural way, the stems of this Rose will climb twelve or fifteen feet or more among the branches of other shrubbery and small trees, but if it is planted alone and has opportunity to develop on all sides the stems will rise for three or four feet and then arch and bend over, with the tips trailing on the ground, and the whole will appear like a little mound profusely covered with large clusters of nearly scentless flowers, which are usually in finest condition from the 15th to the 20th of July. It is perfectly hardy here, and, considering that it is a plant long in cultivation, it is surprising to find it still comparatively a rarity in gardens, and it is even unknown to many gardeners and professional nurserymen. It has not been known to produce seed in this region, so that it is necessary to propagate it by cuttings or other modes of division. Cuttings of half-ripe wood taken at the end of August root without difficulty. The foliage is large and ample, and bears a distant resemblance to some members of the Raspberry tribe or genus *Rubus*. One of the synonyms given to it by a botanist was *Rosa rubifolia*, and under this name it is still sometimes to be found in catalogues.

Our native *R. Carolina* forms the third in this group of useful late-flowering single Roses, for these three are the only hardy species yet introduced which bear flowers as late as or later than the middle of July. A few flowers on each of them may be found as late as the 1st of August. *R. Carolina* is the only one of the three which has an upright bush-like habit. Its flowers are smaller than and not so conspicuously showy as the others, and they are produced in less simultaneous profusion, but they are the late Wild Roses of our own way-sides, and, as they possess a sweet wild-rose fragrance, they are always sure of a place in popular esteem. A single plant will gradually spread by underground shoots until, in a few years, it will form a large clump.

Along the cool sea-coast north of Boston such Wild Roses as *R. lucida* sometimes continue blooming until the middle of July, and in such places the *R. Carolina* is proportionally late. Such Roses as these are the species which should be planted about a sea-shore home, as being most natural and appropriate, and, at the same time, quite hardy and able to withstand the rigor of winter without unusual care.

Arnold Arboretum.

J. G. Jack.

Rose Notes.

EARLY-planted Roses for winter flowering will now be benefited by a thin mulching of manure, but it is safer to err on the side of thinness than to apply too heavy a coating, as the latter frequently results in injury to the plants. The use of a moderate quantity of bone-dust is at all times beneficial to the soil for Roses, providing the bone be of good quality, and the most satisfactory grade of this fertilizer that I have used is that secured from a button factory, because the bone so used is in its natural state, and is much superior as a plant-food to that which has been boiled or dissolved with acids. Good bone-dust feels somewhat greasy when rubbed between the fingers, while that prepared from bones that have been boiled in order to extract the oil is quite dry, and feels gritty to the touch.

As the young Roses make their growth, disbudding must be attended to frequently, for the strength of the plant is all needed to make wood at this season, so as to secure a strong growth ready for winter flowering; and even in winter it is necessary to disbud regularly if flowers of extra size are desired. This is practiced by the large commercial growers who make a specialty of Roses, and they disbud as regularly as they do in the case of *Chrysanthemums*, in order to produce the eight and ten inch flowers frequently seen at the autumn shows. Among the varieties specially benefited by disbudding are the *Bride*, *Catherine Mermet* and *Wooton*, all of which send out lateral buds before the terminal flower opens, and thereby its size is reduced. *La France* is also improved by the same method, for this variety, when growing strongly, often forms lateral buds.

The young Roses should, of course, be staked before the new growth proceeds very far, not only for neatness sake, but also for the welfare of the plants, and it may be worth repeating that the most satisfactory method of staking is by means of a piece of galvanized steel wire about the thickness of a lead-pencil and three to four feet long. This is secured in an upright position by means of a longitudinal wire stretched between supports at each end of the bed. Wire of this character will last for several years, and is not nearly so obtrusive a support as is a wooden stake.

If some space has been devoted to hybrids planted out for winter forcing the plants should now be in active growth, and they will need an abundance of air and water, though, at the same time, the effects of sudden changes of weather must be guarded against to avoid mildew. The main object now is to secure a strong, clean growth. In establishments where space for Rose-growing is limited, it is preferable to prepare hybrids for winter use in pots, as they can then be stored in a cold frame until needed, but it must be conceded that the pot-grown plants seldom produce as fine flowers as those that have been planted out.

The present has not been a satisfactory season for outdoor Roses in this locality. The weather has been too dry, and, as a natural result, the flowers have been small and not lasting. Teas that were planted out for summer flowers have been a total failure, except in some fortunate instances where a liberal course of artificial watering could be given.

It should always be remembered, however, that during dry weather outdoor Roses should have thorough cultivation, and with a proper use of manure a fair sprinkling of flowers may be secured after the main crop is past.

Holmesburg, Pa.

W. H. Taplin.

Some Japanese Bamboos.

LAST year I noted in GARDEN AND FOREST the hardiness of some half-dozen varieties of Japanese Bamboos which, without protection, survived the winter of 1890-91. The same plants also passed the last winter without injury, and there seems little doubt as to their being reliably hardy in this latitude. Further experience with them has, however, made me rather doubtful as to their value here under ordinary cultural conditions.

The Japanese Bamboos which are attainable seem to be all native of southern Japan. The French nurserymen have sent these out under names of their own, generally botanical ones, but a number received with the native names, through the courtesy of Mr. Woolson, seem to be duplicates of those from France. The Japanese, curiously enough, use Chinese names for these and other plants, as was found in tracing up the translations of the names among some of our mild-mannered Occidental merchants. For instance, the Japanese name for Bamboo is "Take," but botanically the Chinese "Chiku" is used in conjunction with the varietal name; thus *Kimmeichiku* is the square-stemmed Bamboo (Castelloni of the French); *Koku-*

chiku is the Black Bamboo (*B. nigra* in French catalogues); Hamchiku is the Spotted Bamboo. Coming from this warm section, which, I believe, has a somewhat humid atmosphere, the Bamboos seem to require a warmer spring than ours to give them an early start. In my garden, at least, which has a cold, clayey soil, they do not seem quite happy, and begin to make growth rather late in the spring. A temperature of sixty degrees and upward seems to be required to make them move. It is very probable that my plants, which have been established about two years, are in too heavy soil and in too dry a position to do their best, and that with careful planting and attention they might make a more thrifty growth, but I doubt if, with their late-moving habit, they are likely to prove satisfactory to any but growers who fancy unusual plants. They are the slowest of plants, also, to become established, and are not things to be shifted from one position to another at the pleasure of the grower.

As pot-plants for conservatory decoration they grow somewhat better, the humid atmosphere seeming to suit them, and their peculiar decorative value is useful among tropical plants. Being grown there they also resent moving outside, and quickly show their resentment by withering foliage. As far as my experience goes, I am forced to conclude at present that the Bamboos are in the garden much inferior in value to the other noble Grasses, as *Eulalias*, *Arundos*, *Erianthus*, etc., which so rapidly each season form grand masses of graceful foliage, and require little care or attention. However, as it is the uncommon and difficult plants which sometimes prove the most interesting, it is to be hoped that further trials of the Bamboos may allow more favorable reports.

Elizabeth, N. J.

J. N. Gerard.

Juncus effusus spiralis.—The spiral-leaved Rush is a curious and interesting plant. A typical Rush-leaf is as stiff and straight as possible, but this variety has smooth green leaves which twist into perfect spirals resembling exactly a wire corkscrew. It is, perhaps, useless to speculate on the conditions which have caused this otherwise modest plant to take on such a form. It is a low-growing plant with no climbing tendency, and the spiral has no apparent use beyond exciting curiosity. Like other Rushes it is a bog-plant, or one for wet places. *Juncus Zebrius*, the Zebra Rush, is another bog-plant well worth growing, the tall stems being striped green and white, and the plant having the appearance of a lot of porcupine-quills. It grows very thriftily in a pan immersed in water.

Iris tripetala flowered last week, quite finishing the season of the family. This is a native variety from Florida, seemingly not quite hardy here. The leaves are dwarf and somewhat glaucous. The flowers purple with wide falls.

Elizabeth, N. J.

J. N. G.

The Forest.

The Forest as modified by Human Agency.—II.

THE following is a continuation of the extracts published last week from an introduction to a course of forestry-lectures delivered before the University of Edinburgh in their session 1891-92 by Colonel Bailey:

"But although the absence of sufficient home-grown produce has not hitherto caused much inconvenience, there is no doubt that, as time goes on, we shall have to go farther and farther afield for our supplies of timber; and that, partly owing to increased local demand in the foreign countries whence we have been accustomed to draw them, and partly to the productive power of the forests having become impaired by overcutting and other injurious treatment, our importations from several of the most important of those countries are falling off, and it may be safely predicted that these supplies will, in course of time, considerably decrease, and that the price of imported timber will rise in a corresponding degree. We may, of course, eventually be able to bring to market the produce of even the most inaccessible forests of the Dark Continent to supply our ever-increasing needs; but it must be said that our future supplies are by no means secured, and that the time has arrived at which it has become our duty to take stock of the situation, and to consider what can advantageously be done to increase the timber production of our islands, so that we may be in a better position than we now are to meet, as far as possible, any interruption in the steady current of our importations which might occur owing to a partial failure of our foreign sources of supply, to the outbreak of war or otherwise.

"Dr. Schlich estimates that we might be able to grow at home £13,000,000 worth out of the £23,000,000 worth of forest-produce we import annually; and the forests created with this

main object would give employment to a very large number of laborers, and would at the same time serve to protect agricultural crops from the effects of injurious winds, and to afford shelter to cattle and useful species of birds.

"The desired increase in the amount of home-grown timber might be obtained by taking measures: (1) To obtain from our existing woodlands the maximum quantity of the best kind of produce that the soil is capable of yielding; and (2) To increase the wooded area by planting and sowing up such portions of our waste lands as cannot be more profitably utilized. It must be confessed that to accomplish either of these things is not an easy matter in many parts of the kingdom, because, while some existing woods are maintained principally on account of their picturesque beauty, a much larger number are kept up as game-preserves, and their proprietors have no wish that they should be treated with a view to obtain from them their maximum yield of wood. Again, vast areas of ground in Scotland are kept under Heather as grouse-moors and so-called 'deer-forests,' which have hardly a tree upon them, and these are greatly valued for the sport which, in their present condition, they afford, so that their owners do not desire to convert them into forests of trees. But in spite of these disadvantages the area of woodland now available for systematic treatment is very considerable, and it might certainly be largely increased with great advantage to the proprietors of the land, as well as to the country at large, not only on account of the increased production of forest-produce, but also by reason of the larger employment of labor that would follow a movement to extend the forests. The following sentences are taken from a recent article in the *Times* newspaper on 'Men and Deer in Scotland': 'Deer-forests by no means bring their owners the large rentals popularly supposed. The famous Blackmount Forest does not yield, it would appear from the Crown agent's figures, sixpence an acre. The group of forests in Inverness-shire, belonging to Mrs. Chisholm, is let at about threepence an acre. Even one penny an acre is not an unknown rate. In Sutherlandshire sporting rents seem to be, on the whole, higher than elsewhere. But one shilling an acre would appear to be quite unusual; and we have no reason to think, notwithstanding the popularity of deer-stalking and the growth of wealth, that rents will improve. Many Highland proprietors let their shootings as regularly as they let their farms, and these are not times in which they are likely to turn a deaf ear to people who say, with any show of good sense, 'I can tell you how to make more out of your estate than by afforesting it.'"

"It is not necessary for me to say that 'afforestation,' in the sense in which it is here used, is the exact opposite of the kind of afforestation that we are assembled here to study, and how such a misleading term as 'forest' came to be applied to a tract of land which is devoid, or almost devoid, of trees, and on which it is not intended to promote the growth of trees, I cannot explain.* If the figures given in the *Times* are anything like correct, the rate per acre derivable from a deer-forest cannot be called high. The average profit on the whole of the French forests, taken together, was, for the three years immediately preceding 1886, about seven shillings an acre. But, of course, the really important point is the rate of interest on their capital value which shootings and forests respectively yield. Dr. Schlich, basing his calculation on Weise's *Yield Tables for the Scots Pine*, concludes that land which cannot be let for the raising of field crops, for shooting, or other purposes, at a minimum rental of two and a half per cent. on the value of the land, may with advantage be planted up with Scotch Pine or other similarly remunerative tree; and I fancy that, even after excluding bare upper ranges, which it would not pay to deal with, a good deal of land in Scotland would be found to fall within this definition.

"Forests are not so exhausting to the soil as agricultural crops; for in the case of the latter the entire plant, except the roots, which are sometimes also taken, is removed; whereas in the case of a crop of trees, the leaves, flowers and fruit, which are far richer in nutritive elements than the wood, are annually returned to the soil, and thus serve to maintain its productive power, as well as, by their protective action, to keep it in a good physical condition. Hence forests can flourish on comparatively poor soil; some kinds of trees, notably most of the conifers, including the Scots Pine, being able to grow on ground that would be quite incapable of producing a series of remunerative agricultural crops. It is, therefore, generally speaking, not necessary to select rich fertile soils for the raising of forests, which ought rather to be established and maintained on ground which cannot be profitably

*I have since been told that the ground is supposed to carry a "forest" of antlers!

cultivated. Scotland has a large extent of land of this kind, which could be planted up without detriment to the sporting interests; and there seems no reason why this country should not be able to produce as fine and valuable timber as is obtained from the shores of the Baltic and from other parts of northern Europe. There is, then, plenty of work before Scottish foresters, both in the way of making the most of existing woodlands and of planting up new areas; and the object of the present course of lectures is to impart to the younger aspirants after fame in this direction some of the leading principles that should guide their endeavors.

"It seems, at first sight, marvelous that the United Kingdom should, until very recently, have been without the means of imparting any regular instruction in this important science; but the fact appears less remarkable when we consider how far cultivated land and pasture have with us taken the place of forest, the large extent to which we have drawn our supplies of timber from abroad, and the comparatively small amount of wood we consume as fuel. There is, however, no doubt another reason why progress in this direction has been so long delayed, and that is the very small area of forest-land in these islands which is owned by the state. In countries where extensive forests are state property, forest-schools were long ago established. I will instance the case of France, with the forests of which country I am better acquainted than I am with those of any other. The forests of France are thus owned:

	Square miles.	
By the state,	3,734=10.7 per cent.	
" communes or parishes, and public institutions under state control,	8,073=22.7 "	
" private proprietors,	23,657=66.6 "	
Total,	35,464	

"Although the state and the communes or parishes together possess only one-third of the total forest-area, the extent of their property is very large, amounting in all to 11,807 square miles. To carry on the management of these large domains, the state maintains a body of highly skilled foresters, who, before their appointment, have received two years' training at the National Forest School at Nancy, at which institution, until a few years ago, candidates for the Indian Forest Service also received their professional education. But it is a remarkable fact, that although private proprietors own no less than 23,657 square miles of forest, or double the amount owned by the state and the parishes together, there is not a single private forest school or class throughout the country; and further than this, although the lectures at the State Forest School are open to the public, advantage is very rarely taken of this privilege by private proprietors. This fact is doubtless due in a large measure to the succession laws of France, which tend to form very small properties; but there are still many large properties with valuable forests upon them, and the explanation of the abstention of private proprietors from any attempt to avail themselves of the means of instruction in forestry which are afforded to them and to their wood-managers is said to be that, as the state forests and the officials in charge of them are scattered about the country, the art of forest-management is more or less popularly known; that private owners have before them the state forests, which serve as models for the management of their own timber estates; and that they can get a certain amount of advice and assistance from state officials, who are occasionally permitted to render aid in this way. But in many localities the private woods are too distant from state or parish forests to permit of their owners obtaining any assistance from the government officials; and they are then thrown entirely on their own resources, with the result that although, speaking generally, the principal private forests are well managed, mistakes, and grave ones, are frequently made.

"I may perhaps here mention that in France private proprietors cannot clear any wooded area without notifying their intention to do so at least four months beforehand; and the government officials can, with certain exceptions, successfully oppose the clearance, if the continued maintenance of the wood is considered advisable on any of the following grounds, viz.:

1. To protect mountain slopes.
2. To protect the soil from erosion, and to hinder encroachments by rivers, streams or torrents.
3. To preserve springs and watercourses.
4. To protect coasts against erosion by the sea, and against the encroachments of moving sand.
5. For the defense of the national frontier.
6. For sanitary reasons.

"But although private proprietors in our country are not subjected to any such interference with the disposal of their property, they have none of the advantages which the existence of extensive state forests, and the presence among them of state forest-officials, gives to private proprietors in France; and in these islands the science of forestry is almost unknown outside a small circle of professional men, who, to their credit be it spoken, have acquired the valuable practical knowledge they possess without any of the advantages afforded by a previous study of the principles evolved by experience in countries where systematic forest-management has been long practised.

"But, in spite of these disadvantages, Scotland can show numerous well-managed forest-estates—such, for example, as those of the Duke of Athole, of the Earls of Mansfield and Seafield, of Lord Lovat, and of other proprietors who might be mentioned; and it is universally admitted that the art of raising nursery plants, of establishing plantations, and of rearing park trees is here carried out with a success unsurpassed by the foresters of any other country. Our Forest-class has thus the great advantage that excellent practical instruction in work of this kind can conveniently be given to it.

"It is impossible to mention the Duke of Athole's forests without alluding to the loss we have recently sustained by the death of Mr. John Macgregor, a representative Scottish forester, who has done much to forward the progress of forestry in this country, and whose well-known figure will be missed from among us for many a year to come.

"But I believe I am justified in saying that certain branches of the science have unavoidably received less attention than is desirable. I allude principally to regeneration by natural means (that is, felling in such a manner that the old trees may be caused to produce their successors in the form of self-sown seedlings), and to the preparation of working plans or schemes of management, by means of which continuity in the system of treatment is secured, the forest is made to yield the maximum quantity of the most paying kind of produce, and provision is made for the removal of a regular annual or other periodical yield; at the same time the owner is enabled to realize the full yield with confidence, and his forest is secured against damage by overfelling."

Correspondence.

Orchard Spraying.

To the Editor of GARDEN AND FOREST:

Sir,—I have read with interest the comments of Professor Bailey upon my observations on the question of insecticide and fungicide spraying. On some points I quite coincide with what he says. On others I remain in doubt, and the subject will bear more and fuller discussion before we lay it aside. Without doubt, the spraying will go on. I would be among the last to favor its prohibition. Its immediate benefits are manifestly important. Some crops would be prompt and utter failures without it. For years I have sprayed for the currant-worm, the cabbage-worm and the potato-bug, and have tried to destroy the onion-maggot by scalding, with considerable success. Squashes, melons and cucumbers I have "bugged" sedulously; but all the time I have been thinking how it was that the world got along in this matter before hellebore and Paris-green made their advent on the farm and in the garden.

When I began farming in northern Vermont, of all these pests only the squash "bug" (striped) was known here; but as the currant and cabbage worms were both imported to this continent by the way of Canadian seaports, I made their acquaintance some years before their moths had fluttered their way down to the vicinity of New York. The only great insect pest on the farm I had before known was the wheat-midge (misnamed "weevil" by the farmers), which, in two or three years, abolished the leading commercial crop of northern New England. For near thirty years wheat was a blank in the crop returns of this section; but we are now growing it with as good success as of old. Of fungous attacks, the only serious one in those days was the potato-rot. But the wheat-midge and the potato-rot were severe blows to New England agriculture, and became determining factors in the great western emigration which has kept the rural population of northern New England stationary for the last four decades.

The most noteworthy fact in all this is, perhaps, that both the insect and the fungous plagues abated, and practically ceased to be prohibitory to the cultivator, without other than natural aids. It is a most interesting question, whether, in availing ourselves of poisons, we are not at the same time prolonging the evils, or, perhaps, making them persistent. No one can

deter, and no one would wish to deter, cultivators from protecting their crops by the use of insecticides so long as it is profitable to do so. In suggesting that in orcharding, at least, we might find an easier and better way out by the adoption of species and varieties of greater resisting capacity than those we at present possess, I but point out a resource which has not yet attracted much attention except among the fruit-growers of the cold north, who have been forced for quite other reasons to become familiar with a distinct class of tree-fruits—namely, those of north-eastern Europe and north-eastern Asia. Primarily, these were brought to America because of their hardness against cold. Experience is showing us that they also excel our older fruits, derived from western Europe, in other important points; and among these are those very troubles for relief from which the orchardists of our states of milder climate are resorting so extensively to fungicide and insecticide spraying.

Among the greatest difficulties encountered in our earlier efforts toward orcharding in the north-east was the fact that even when we got hold of tolerably hardy varieties of the old stock—such as Fameuse and McIntosh Red—we found them falling speedy victims to fungous spotting. Growing alongside of these strongest among the weaklings, however, we could but notice the very different conditions of the few trees of the early importation, via England, of Russian apples. Quite free from fungi, and much less injured by the Codlin worm, these Russians attracted marked attention, in contrast with the few kinds of the old stock which we grew, but only at "a poor dying rate." Now, I am not a monomaniac on these eastern apples and pears, or on anything else, I hope; but this I know, that whereas once I despaired of our ever establishing orcharding on a commercial basis in northern New England, Quebec and New Brunswick, now, by the introduction of these fruit-trees of Russia, we are being rapidly placed in a better position than the great fruit-growing middle states. And while I am quite desirous that these iron-clads should be better known and understood in that section where they are most needed, I also want their good qualities to become known elsewhere. I believe the time will come when their wider adaptation to all of North America, east of the Rockies, will be understood, and the work of replacing with them the orchards of the less well-adapted fruits of western Europe be taken up. Certainly, the strongest protection of our orchards must be found in the vigorous organization of the trees which compose them. This is equally true as against climate, insects and fungi.

It was certainly an astonishment to me to read in Professor Bailey's article the statement, that if every variety of Apple subject to apple-scab were uprooted, "then, in western New York, at least, we should have no market apples left." I cannot suspect a man of scientific training of exaggeration, yet I can hardly conceive of this state of things as being true. If it be generally true, then the orchardists of our middle states cannot too soon give their attention to the selection of better varieties of apples from a more vigorous race. The apple-scab fungus attacks both leaf and fruit. Its seat is, primarily, upon the leaf, but the constitutional defect which admits of its attacks adheres in the entire tree, and in the race of trees so subject. The remedy, therefore, must be a radical one. Decadence is sure in the orchards of New York, unless such a radical remedy is found. The pomologists attached to the agricultural schools of the states where this disease of the apple prevails should not be satisfied with palliatives, but should earnestly study to understand and master the whole array of facts regarding the tree-fruits of other continents and their adaptation to our own.

This is a wider field than I ever expected to enter upon in my pomological studies. I can only indicate a path for younger men to explore.

Newport, Vt.

T. H. Hoskins.

Recent Publications.

The Massachusetts Society for Promoting Agriculture. Centennial year (1792-1892).

In this modest volume of 146 pages there is simply told something of the history and achievements of this venerable, although still active, society, which, a few weeks ago, celebrated the centennial anniversary of its organization on the 14th of June, 1792, although it had been incorporated by an act of the Massachusetts Legislature passed on March 7th of that year. John Hancock, as Governor of the Commonwealth, signed the deed of incorporation, and the name of Samuel Adams appears at the head of the list of the incorporators.

It is interesting to note that the Massachusetts society ante-

dates all others in that state, and, as a corporation, all similar societies in the United States, although associations for the advancement of agriculture had been established a few years earlier in New York and Pennsylvania; there was an earlier society in Canada, while in Great Britain, to which we are accustomed to look for agricultural leadership, little had been done until the beginning of the present century in organizing agricultural education, although at the time the citizens of Boston were engaged in this work the Dublin Agricultural Society, for many years a feeble body, was in existence, and the Highland Society had been incorporated in 1778. The British Board of Agriculture was not established, however, until 1793.

From the beginning the Massachusetts Society has been managed by a board of twelve trustees, including the president, two vice-presidents, a treasurer, and recording and corresponding secretaries, and it is an interesting fact, suggestive of the stability of Massachusetts families, that the same names appear generation after generation in the roll of the trustees; it is pleasant, too, to note that a member of the present board, a man honored for learning, integrity and public spirit, is the great-grandson of the first vice-president and of the first president, and the grandson of the sixth president. There is, perhaps, no other roll of officers of a corporate society in the United States which contains the names of such a list of distinguished men, and, certainly, no other organization of the kind has done more to promote the agricultural development of the country. Thomas Russell, the first president of the society, was one of the foremost and most prosperous citizens of Boston, the first president of the Massachusetts Bank, organized in 1784, of the United States Branch Bank at its organization in 1792, and of the Charles River Bridge Corporation. In the list of petitioners for the society appear, too, such well-known names as Martin Brimmer, John Codman, Christopher Gore, a senator in Congress from 1813 to 1816 and a benefactor of Harvard College by a gift of \$100,000, at that time an enormous sum; of Benjamin Guild, Steven Higginson, John Lowell, Jonathan Mason, David Sears and Thomas L. Winthrop. John Adams was president of the society from 1805 to 1813. Among the trustees have been three generations of John Lowells. John Thornton Kirkland, afterward president of Harvard College, was a trustee from 1798 to 1811. Fisher Ames served on the board from 1800 to 1804, and Josiah Quincy from 1805 to 1809. Daniel Webster, who took a deep interest in its proceedings, was a trustee from 1833 to 1853, Edward Everett from 1850 to 1855, and Robert C. Winthrop from 1853 to 1862; and there is hardly a family that has been prominent in the last hundred years in building up the material prosperity of the commonwealth which has not had its representative at some time or other on this board.

This is hardly the occasion to recite all that the society has accomplished for agriculture, as the term is usually understood, in the past hundred years; but the trustees have administered their trust in a broad and intelligent spirit, and we find that, in addition to the improvement of live stock and the increase of good tillage, they have been occupied from very early days in developing the knowledge of botany, horticulture and silviculture.

At the second meeting of the society a paper on the diseases of fruit-trees, that had been recently printed by William Forsyth, gardener to the King of England, was read and afterward reprinted in the society proceedings. At the meeting held in January, 1793, the society voted to offer two premiums, the first in its history, for "the most satisfactory account of the natural history of the Canker-worm" and "for the most effectual and cheapest method of destroying these insects." The trustees, in February, 1794, appointed a committee "to consider the expediency of procuring a piece of ground for the purpose of agricultural experiments." Finally, this project took a different shape, and led to the establishment of the Botanic Garden at Cambridge. In 1801, the society voted to appropriate \$500 toward the foundation at Harvard College of a professorship of natural history, which was finally established in 1804. The plan, so far as connected with the object of the society, provided for the scientific observation of the growth of plants and of the habits of insects injurious to them, and for the cultivation for sale and distribution of the seeds and roots of useful plants. The co-operation of the society and the college in conducting the Botanic Garden continued for a quarter of a century, during which period the society voted annually a sum of money from its own funds for carrying on the garden. The Harvard garden was the first botanic garden connected with a public institution founded in the New World, the only earlier garden of scientific reputation having been the so-called botanic garden

of John Bartram, the Philadelphia botanist, which was a private and not a public garden.

The prize offered by the society for the essay on Canker-worms was awarded to Mr. W. D. Peck, who was the first occupant of the chair of natural history in Harvard College, and it was by him that this garden was laid out, which has since obtained a world-wide reputation from the fact that for nearly half a century it was the home of Asa Gray. In late years the society has aided, by sums of money, the Botanic Garden, the Arnold Arboretum and the Bussey Institution of Harvard College. It has made possible the publication of important scientific papers like Professor Farlow's essay on the Black Knot; it has published a translation of De Cars's treatise on the pruning of forest-trees, and has stimulated tree-planting by the offer of large and comprehensive premiums.

F. A. Michaux, the author of the classical work on North American trees, was an honorary member of the society, and at his death showed his appreciation of its worth by bequeathing to it a considerable sum of money as a testimonial of gratitude to the hospitality and assistance which he and his father had received in this country during the course of long and toilsome journeys.

The proceedings of the society which, unfortunately, were discontinued many years ago, contain the best record of the early agricultural and horticultural development of New England and are a monument to the industry, zeal and intelligence of the early trustees. In them will be found the record of many interesting investigations and of much good work.

We have only mentioned briefly the efforts of the officers of the Massachusetts Society to improve those departments of rural economy in which the readers of this journal are most directly interested, but farmers will find in this record of its work much to interest and stimulate them. Its centennial volume is printed, we understand, for gratuitous distribution, and can doubtless be obtained from the recording secretary, Mr. Francis H. Appleton, of Boston.

Notes.

It is stated that the damage from blight, mildew, rot and yellows done to the fruit crop of the country amounts to not less than \$50,000,000 annually.

A place of interest to all lovers of the history of the art of gardening, Alexander Pope's villa at Twickenham, on the Thames, is now for sale. For nearly twenty-five years it has been occupied by Mr. Henry Labouchère.

The August number of *Mechans' Monthly* speaks of the Edmonds Pear, as it has fruited in Germantown, as rather larger than the Duchesse d'Angouleme, although the quality is not quite as good, or perhaps it should be stated that the flesh is lacking in the juiciness which characterizes the Duchesse. It is one of those pears which ripen first from the inside while the outer part is still solid, although in good condition to be eaten.

An attempt has just been made to send fresh fruits direct from California to England, a consignment having recently been shipped from this port by the swift steamer *Majestic*. A train of five cars left Sacramento at ten o'clock one Monday night, and reached New York on the Tuesday of the following week, and its burden was immediately transferred to the vessel, which had been fitted with refrigerators capacious enough to receive the entire quantity.

Mr. Thomas Griffin, of Westbury, Long Island, brought to this office last week some remarkably good flowers of the Tuberos Begonia, of which he makes a specialty. We were particularly interested in the strain which seems to have a distinct Tea Rose fragrance. The specimens we saw were all single-flowered, and in color they were pure white at the base of the petals, shading to a clear pink on the border. Mr. Griffin stated, however, that he had fragrant flowers in all colors, ranging between pure white and a dull red. He also states that he has some semi-double flowers which have a distinct fragrance.

The Hard Hack (*Spiræa tomentosa*), which is now blooming by many country road-sides, is a shrub that deserves more attention than it has received. The short racemes of rose-colored flowers are crowded into a dense panicle, and they remain open a long time in the season when few shrubs are in bloom. Among the herbaceous native species the Queen of the Prairies (*S. labata*) is also worth cultivating, as well as the Goat's-beard (*S. Aruncus*), although they are now both past their bloom. This last one, often seen in European gardens, is a plant of noble bearing, and its panicles of creamy flowers

attain magnificent proportions in deep rich soil. There is great difference in the quality of the flowers of *S. palmata*. In one variety they are of a bright rose-color and have a distinct fragrance.

The "Listener," of the Boston *Transcript*, recently described a Currant-bush filled with ripe fruit which he had seen growing in the fork made by the principal branches of the so-called Washington Elm at the village of Wellesley, near Newton Lower Falls, not far from Boston. The trunk of this tree—under which Washington is said to have halted when on his way to take command of the army at Cambridge—is much larger than that of the Washington Elm in the latter place, beneath which the ceremony was performed. Life, however, is left in only one of the great branches into which it divides. The Currant-bush, conspicuous at all times, but especially when loaded with scarlet fruit, flourishes about twenty-five feet above the ground.

"The engaging heroine of a play," says Mr. W. D. Adams, in his "With Poets and Players," "is never or rarely without her flower-basket or artlessly arranged bouquet. . . . All eligible young ladies in stageland have a passion for 'the stars that in earth's firmament do shine.' They stick them in their hair or in their waist-bands, but most frequently they carry them prettily in their hands. They usually make their entrée in that manner. They convey the impression that floriculture is the badge of all the feminine tribe—or of all, at any rate, that is young, and handsome and ingenious. When they sit down it is to play artlessly with the flowers in their laps. Apparently the stage demoiselle has nothing whatever to do but to sort and arrange these things. The more interesting the conversation, the more patiently she goes on sorting and arranging them. When the talk flags, she walks over to a table and distributes them among the vases, taking great pains about their appropriate disposal. On the boards the difficulty is to know what to do with one's hands, and leading ladies solve the problem by coming laden with flowers."

We cannot too often call our readers' attention to the good work being done by the Flower and Fruit Mission in this city, and to the little trouble it costs persons in the country to contribute from their overflowing stores of flowers. The headquarters of the mission are at 104 East Twentieth Street. It is open, for the distribution of flowers, fruits, fans and other articles comforting to the poor and sick, on Mondays and Thursdays; and packages addressed to it are carried free by the express companies. Although as many as eight thousand little bouquets have sometimes been sent out in a single day, more are needed; and gifts are especially welcome when donors spare the busy distributors extra work by themselves tying up the flowers in small and tasteful bunches. They go to the prisons, the almshouses, the hospitals and the tenement-houses; and in all of these places even a single blossom is hailed with delight by persons who seem sunk beneath any good or pleasant influence. The mission tells of one sick old woman who will not part from her withered bouquet until a kind hand brings her a fresh one to replace it; and if all the pathetic stories which might be told could only be rehearsed in public hearing, the packages received at the mission would surely increase at a rapid rate.

It takes a big pile of kindling-wood, says the *Northwestern Lumberman*, of Chicago, to start the fires in the stoves of a large city every day. Suppose a small armful is used in a stove, and that there are a quarter of a million or more stoves, as there are in this city, and it can be seen that it would keep a good many slabbing saws busy to supply the demand. The kindling-wood business of Chicago has passed through one period, and has now reached another. Heretofore it has been no trouble to get kindling. Slabs were bought sawed or unsawed, as the case might be, and the servant-girl was at liberty to use all of them she wanted to. But now they are becoming a luxury. Ask any wood-yard man doing a business of any size, how his stock of dry slabs is, and he would say that he stands ready to buy a hundred car-loads. Old plank sidewalks, which are being replaced with concrete, are cut up into kindling. Such walks are speculated in to about the extent that wheat is over on the Board of Trade. Not long ago a North-sider sold an old walk to a woodman for \$6.00, and without handling a plank of it the walk was sold for \$107. And that price, too, was paid for it for kindling-wood. So you see the wasteful period of the kindling-wood business has been passed through. Not in the far future, we suppose, the Chicagoan, like the New Yorker, when he builds his fire, will toss in the stove a little bundle of slivers all tarred and tied up for the occasion.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLE :—Taste Indoors and Out.....	373
By Bicycle to the Waverley Oaks.—I.....	<i>Sylvester Baxter.</i> 374
The Sugar Maple. (With figure.).....	<i>Floy L. Wright.</i> 375
Notes on the Flora of Smythe County, Virginia.—II.....	<i>Anna Murray Vail.</i> 375
Italian Garden Tools.....	<i>Louise Dodge.</i> 376
NEW OR LITTLE-KNOWN PLANTS :— <i>Aster amethystinus.</i> (With figure.).....	377
FOREIGN CORRESPONDENCE :—London Letter.....	<i>W. Watson.</i> 377
CULTURAL DEPARTMENT :—Strawberries, Old and New.....	<i>C. E. Hunn.</i> 379
Southern Tomato Blight at the North.....	<i>Professor Byron D. Halsted.</i> 379
Violet Disease.....	<i>E. O. Orpet.</i> 381
Chrysanthemums.....	<i>T. D. H.</i> 381
Hardy Narcissus.....	<i>E. O. Orpet.</i> 382
CORRESPONDENCE :—A National Wild Flower Exhibition.	
A Tropical Plant-house.....	<i>Professor William R. Lazenby.</i> 382 <i>T. D. Hatfield.</i> 383
NOTES.....	384
ILLUSTRATIONS :— <i>Aster amethystinus</i> , Fig. 63.....	378
A Sugar Maple in Ohio, Fig. 64.....	380

Taste Indoors and Out.

THAT cultivated Americans have a natural sense of fitness in dress and household adornment is admitted by even the critical French nation, which is more secure than any in matters of taste; but when they undertake to deal with the problem of the arrangement of grounds it is curious to see how their sense of proportion and appropriateness fails them, and how people who would not permit a discordant rug in their drawing-rooms or an ugly book-case in a library or an undesirable horse in their stables, will allow incongruous trees and shrubs to be planted, and unsightly rockeries and flower-beds to be cultivated in the wrong places about their houses. The perception of breadth and unity seems hard for them to attain, possibly because people are by nature more imitative than original, and our civilization as yet affords them but few good examples to copy.

In an untraveled department of art people are apt to go astray, to consider that what they like is necessarily a good thing. Original conservation makes men hesitate to make new departures. They fear to cut away a tree because it is itself beautiful, and fail to grasp the broad effects of landscape that may result from judicious destruction. A vein of sentimentalism, of association, of fancied picturesqueness, mars their final effects. Women, especially, may be great in a flower-garden—they are seldom great on an estate where prettiness, variety, daintiness, delicacy are required—there they shine; but landscape-gardening on a large scale is, after all, a masculine art, and requires a certain manly vigor of treatment, an unhesitating despotism, that the gentler sex deprecate as cruel and unnecessary. Women may be generally held responsible for the false details we so much deplore, because American men, as a general thing, are too much occupied to give much attention to their grounds

and leave their arrangement to their gardener and their womankind.

The former is naturally a good right arm, sometimes opinionated and lacking in that broad experience only to be obtained by travel and study. In his own sphere he shines, but it is not his business to be an artist. When he attains that distinction he abandons gardening and looks for work of wider range and greater opportunities.

But there is no reason why a woman of taste should not master the science of outdoor beauty, and conform her arrangements to its rules rather than to her own caprice. It is not an exact science, to be sure, but still landscape-gardening has its laws as well as household arrangement, laws which, while permitting great variety, still give a test by which to distinguish between the true and the false, the meretricious and the really beautiful. The knowledge of how to create and to preserve the beauty of one's surroundings is surely as valuable as a sure taste in carpets and draperies, but it is rarer to find. That it prevails more widely in the older world is partly due to the more stable conditions of residence, the maintenance of an estate by one family for many generations, an early familiarity with cultivated grounds, and free access to public places and parks which have been laid out by men of real knowledge and highly trained perceptions.

Here we come to the subject in our maturity, a man buys a place after he has made his fortune, accepts the conditions of his predecessor without question, or goes to work to alter them without much consideration. The mistress of the estate, with still less training and experience, undertakes to decide where things shall be planted, and what they shall be, often with melancholy results. Sometimes the theory of letting things alone is carried to excess. Wild shrubs and weeds are allowed to encroach too closely upon a stately house; dignity is sacrificed to a picturesqueness which is out of place. The fact is ignored that things which in themselves have beauty are not necessarily appropriate for formal uses. To understand the proper subordination of nature to art requires the most subtle perception and trained skill. Again, the relation of fences to an establishment is not always given due consideration. There is a taste in gate-posts as well as veranda-columns, which often goes astray. Refinement in every detail is as essential in well-kept grounds as in a drawing-room; a false note struck is a distress; a picturesque object in the midst of a formal arrangement is a mistake. Overcrowding is a prevailing fault; there is excess of decoration where quietness should prevail; feeble and unimportant shrubs and trees are allowed to overpower more valuable neighbors to the detriment of the place; gay flowers are planted where they are out of key with the surroundings; clutter takes the place of repose; a thicket supplants a pleasing group of trees or shrubbery.

All this shows that taste can be highly cultivated in one direction, and starved in another, and the question is, which stands for the highest type of civilization, a knowledge of the fitness of things in the interior of the house, or the same knowledge applied to its surroundings? Taste in outside matters is certainly rarer than in household decoration or in architecture; a demand for the landscape-architect is in this country almost an evolution of to-day. That he is sorely needed the condition of many country places shows, and there is a call for men of genius in the profession to establish a standard, not necessarily a conventional or a rigid one, but something which shall afford a criterion of taste in the arrangement of pleasure-grounds and make of the adornment of country places a less haphazard thing than it is to-day, when it depends almost entirely upon individual fancy.

Life in the country gains more and more a hold upon our branch of the English people, and we begin to develop the same interest in it that has characterized the older branch, as our habits become more settled and permanent. The time is probably coming when the nomadic habits of Americans will change for a more conservative way of

living, and the possession of land as it grows rarer will be more dearly prized. Therefore, taste in the management of estates will grow and improve along the lines that are indicated for it, and it is important that such taste should be guided in the right directions, and taught to seek for the best models, rather than be allowed to grope wildly in search of beauty, which, after all, though sometimes attained by a happy chance, is really within the reach of all landholders by careful planting and thinning of vegetation. And we would urge upon women to address themselves to the acquirement of solid knowledge on this subject, as the best foundation for taste in the arrangement of their grounds. It is a healthful, beautiful and useful pursuit, far more valuable than the decoration of bits of china or the production of amateur pictures of doubtful value, on which they waste so much time that might be better employed.

The same amount of thought and time and artistic perception that goes to the production of a trifling sketch might well be turned to account in the manipulation of growing things, in the planning of a rustic dell, the preparation of some pleasing surprise at the end of a shady walk through extensive grounds, the discovery of a hidden point of view, and skillful use of it, the construction of some dainty bit of garden in an unexpected spot. All this would be of value to feminine development, both physical and mental, and by such exercise her taste would grow more secure, her thoughts would be filled with natural objects in their relation to each other, and a country life be made fruitful in health, and in a growth of perception of true beauty.

By Bicycle to the Waverley Oaks.—I.

WHERE the roads are as good as those about Boston the bicycle has provided those who keep no horses or carriages an easy and delightful means of visiting the beautiful spots in their neighborhood. The wheelman needs to study no time-table, but is always ready to visit any pleasant spot within a range of ten or fifteen miles, and in the course of a season I have become familiar with all the aspects worn by many such spots. Close at hand, for instance, are the Middlesex Fells and the Pine Banks, coursed by several miles of beautiful roads. Both are probably destined to become important features of Boston's metropolitan park system. The Lynn Woods are only a few miles away, and a most attractive woodland and rural country intervenes, some of which, in the valley of the Saugus River, is, perhaps, destined to reservation for park purposes. The Lynn Woods, by the way, have just been still further enlarged by the addition of the hilly and well-wooded Ox Pasture region lying to the northward of Glen Lewis and Walden Ponds. This tract includes the celebrated old wolf-pits built by the early settlers. It adds about four hundred acres to the public domain, which it increases to an area of something like a round two thousand acres. As this tract is on the water-shed of the aforementioned ponds, which form an important source of the Lynn water-supply, it was taken by the Water Board to assure freedom from possible pollution by future occupancy. A few thousand dollars now spent in the way of precaution undoubtedly saves a future expenditure of many thousands by way of remedy. This commendable step of the Lynn Water Board is largely due to the wise counsel of Mr. Philip A. Chase, the chairman of Lynn Park Commission, who has done so much toward the realization of this noble public forest.

It was a cloudless July day when I mounted my light roadster for a run to the Waverley Oaks. In spite of the exercise, the wheelman who takes an easy pace on a hot day is little troubled by the temperature. Indeed, he feels the heat less than if he were keeping still. If the air is calm, the motion fans him with a gentle breeze, and on returning home he is often surprised to learn what a hot day it has been. The way from Malden to Belmont is full of interest; and owing to abundant rains, forest and field are delightfully fresh and green this year. The first part of the way is over the historic old Salem road, the first highway connecting the original settlements of the Massachusetts Bay Colony, Boston and Charlestown, with Lynn and Salem. A wild and solemn old road it must have been at first, cautiously traversed by the early settlers, haunted by fears of Indians and wild beasts. A large portion of the way it still bears the name of Salem Street. At Med-

ford it now becomes Main Street; there it turns sharply to the left from the old town square and crosses the Mystic River by the single stone arch of the Cradock Bridge. This crossing of the Mystic is the reason for the roundabout course of the old Salem highway, which, on this account, makes a detour of several miles from a straight course. For at this point, in the old days, was the first practicable ford of the Mystic passable, of course, only at low water—hence the name of Medford, which, unlike most of the old towns, has no English name-sake, but is derived from "Meadow Ford." The Mystic River gets its name from the Indian "Mistuck," which means a great tidal stream.

The rocky heights of the Middlesex Fells trend off to the north-westward, and Salem Street turns from their base across the Medford plains. These plains were once covered with noble great Oaks, whose existence near the river gave birth to the now vanished ship-building industry, which made the A No. 1 Mystic-built craft of Medford famous for their sterling qualities all over the world. Here at Medford was built the first vessel in the Colony, the Blessing of the Bay. These Oaks of the Medford plains rivaled those of Waverley, as may be seen by a fortunately surviving group on the beautiful old Governor Brooks' place, at West Medford. All but a few trees of the woodland that, until lately, still remained on the plains have vanished before the Gypsy Moth crusade, and new suburban streets are covering the territory.

Through Medford we pass by a number of interesting old colonial houses, up the hill over High Street, overlooking the Mystic. The stately old Unitarian church, where John Pierpont used to preach, stands at the top of the hill, and just beyond, on the other side, is the picturesque Episcopal church, one of Richardson's early designs in Gothic, built of field boulders and mantled with both English and Japanese Ivy. If the Metropolitan Park Commission lays out a Mystic Valley Park, as has been suggested, this hill-slope of old Medford, with its old-fashioned tree-embowered houses, and its two characteristic church spires—old Colonial, in wood, and English village, Gothic, in stone—will make a notable feature in the landscape.

The road to Arlington passes by the lower part of the Governor Brooks' place and crosses the Mystic by a wooden bridge near the mouth of the lower Mystic Pond, up which there is a lovely vista of blue waters, backed by the high slopes of the Woburn, Lexington and Arlington hills. Arlington and Belmont are in the land of market-gardens, which place some of the Boston suburban towns in the foremost rank of Massachusetts agricultural communities. On the left we pass a row of greenhouses bordered by a line of electric arc-lights, the scene of what I am told is a very successful experiment in the commercial application of electricity to hastening the growth of plants and market vegetables. The air at intervals along our route through these two towns is redolent with the pungent odor of growing cabbage, cauliflower and onions.

Arlington is the historic Menotomy of the revolutionary days. The old Cooper's Tavern, where two of the Minute Men were killed by the British on their retreat from Lexington, still stands on the corner as we turn into the wide main highway that comes from Cambridge. It bears the old name on its brick sides, with suitable inscriptions concerning its history, but in front there is the commonplace designation of "Arlington House." It would be well to drop the new name. A house with such a history should not cheapen itself with an alias.

We pass but a few rods along the famous highway down which the sadly harassed British troops came back from Lexington on that memorable 19th of April, a day as hot and beautiful as this July day. Beyond the railway station we turn into the Elm-arched road to Belmont, which resembles a long Gothic cathedral nave, and its solid macadam surface has been rolled to perfect smoothness. This street is well worth the tribute paid it by Trowbridge, one of the most genuine of American poets, in his poem called "Pleasant Street." On the left, occasional glimpses of Spy Pond, one of the beautiful lakes of the Boston suburbs, are caught through intervening trees and dwellings. As with most of the other suburban lakes, no attempt has been made to give the public the advantage of a landscape feature such as many a city in the Old World would give hundreds of thousands of dollars to possess. Spy Pond forms a charming and valuable feature of the estates whose fine grounds border it. But, as the population in the metropolitan district becomes denser, and land increases in value, the shores of all these ponds are likely to become disfigured with unsightly dwellings and skirted by various nuisances, until they are transformed from public adornments into eyesores.

In Lynn, Melrose and elsewhere this process of deterioration is well under way. In the former municipality, thanks to the thoughtful initiative of Mr. Chase, the first steps toward a better condition of things have been taken in the purchase of a narrow strip between the street and Flax Pond, near the entrance to Lynn Woods, covered with a fine grove of White Pines.

How much more valuable to the town of Arlington would be Spy Pond were its shores skirted by pleasant paths and drive-ways, with the intervening land reserved to the public and tastefully planted! What an exquisite effect would masses of Rhododendrons, Azaleas and other blossoming shrubs make upon the borders of these ponds, clustered among the trees and other natural growth of the localities.

The proper treatment of all these suburban sheets of water should form an essential feature in the work of the Metropolitan Park Commission. The Boston Park Commission has recently taken the shores of Jamaica Pond, in West Roxbury, and that fine sheet of water will soon form a prominent feature of the Boston park system. The town of Wakefield has had the forethought to convert a large portion of the shores of Lake Quannapowitt into an attractive pleasure-ground; Cambridge has built a drive-way around Fresh Pond, hardly developing its landscape possibilities to the best advantage, however; and the several communities that derive their water-supply from Spot Pond, in the Middlesex Fells, have recently taken the entire shores of that exceptionally charming lake. This is about all that has been done in that direction in the Boston suburbs, as yet.

At the Belmont town-hall, a beautiful brick structure designed by Hartwell & Richardson, Pleasant Street turns to the right and runs along the slope of a narrow pass between the hills, in the depth of which there is just room enough for the Fitchburg and the Central Massachusetts Railroad tracks. Shortly beyond are the Waverley stations of the two lines, the most convenient point of approach for those visiting the Waverley Oaks. A few rods beyond the street leading from the railway stations our way dips into a sylvan glen where a large, clear and rapid brook crosses beneath a low rustic stone bridge, and a road to Lexington and Concord, called Mill Street, forks off to the right and passes up the hill. Near the bridge a guide-board bears the picturesque name of Partelo Road.

Boston.

Sylvester Baxter.

The Sugar Maple.

MAPLE-TREES are characteristic of northern Ohio, and add a distinctive and special beauty to the landscape. They are more abundant than other trees, and help to give that air of prosperity and luxuriance to the country that is missed as one journeys up the chain of the Great Lakes. To those who have lived among Sugar Maples and enjoyed their sweets in the early spring, and later the light of their willowy colored blossoms mingled with the tender red foliage of their kin, they become an essential feature in the spring opening. We love these annual displays as others love their native hills and mountains.

The blossom of the Red Maple is the true harbinger of spring. It is all fiction about the bluebird. He comes along in the late winter, and we find him half-frozen in the sleet, fluttering against our windows for light and warmth. But when these red tints begin to show themselves in the borders of the woods then we know that other trees are in a fair way to bloom, and that spring is surely coming. The Maple is not, as regards size, of exceptional growth. The dense foliage and cleanliness recommend it to the lover of shade, and its symmetrical shape renders it especially adapted to the road-side. One farmer in this locality, with an eye for artistic effect, years ago planted a row of Pines on one side of the road which passed through his farm, and on the other side a row of Maples; they were, doubtless, wisely cared for, for they stand now, in unbroken lines, vieing with each other in wondrous contrast, and make an avenue of an otherwise commonplace country road. The two varieties, commonly known as hard and soft Maple, make up the greater part of the trees which adorn our "Forest City." The fruit of both the Sugar and Red Maple is winged and similar in shape, but that of the Sugar Maple does not ripen until fall, sprouting the following spring, while that of the Red Maple ripens in early summer and germinates at once, making sturdy plants by fall. In this way the Red Maple obtains a year's start of the other species.

The Hard Maple is the most commonly tapped for sugar-making. Other species yield sweet sap, but their buds start earlier, and the finished product is thus rendered dark-colored and of

poor quality. Those who have made the industry of the manufacture of maple-sugar a study, estimate a net profit of ten per cent, on the capital invested. If this is the case there is no good reason why it should not be profitable, for, unless it be the Walnut, or possibly the Chestnut, there is no tree worth growing for its timber that will yield yearly so large an income. No great attention has been given to the making of maple-sugar as an industry, and until within a few years the methods of evaporation have been primitive and much of the product comparatively poor in quality, besides the waste from want of convenient receptacles for storing sap. Now, that it is so difficult to obtain unadulterated sweets and confectionery is such a doubtful compound, maple-sugar should be more highly prized, and more widely distributed in states where the Maple is not native. From the natural condition of things such a business will never become a monopoly, and there will always be a demand for the pure article.

The illustration of the Sugar Maple on page 380 is not that of a typical tree. It is of unusual size. The trunk, two feet from the ground, measures thirteen and a half feet in circumference, and the largest limb, at a convenient distance from the body, eight feet. The branches spread either way a distance of fifty feet, shading the ground a space of one hundred feet in diameter. The tree is tapped annually, apparently without impeding its growth or injuring it in any way, and it yields each year sufficient sap to make three gallons of syrup. It is a forest-seedling, and no one knows its age.

This magnificent Maple stands in the front dooryard of Mr. Luther Parker, a venerable gentleman eighty-three years of age, who values it above anything else upon his farm. It is on the well-known North Ridge Road, forty-five miles east of Cleveland.

Geneva, Ohio.

Floy L. Wright.

Notes on the Flora of Smyth County, Virginia.—II.

MANY of the tributaries of the Middle Fork of the Holston River, all noisy little brooks, rise on the Iron Mountain or on one of its spurs, Brushy Mountain. One of these streams, Staley's Creek, winds in and out among the little hills to the south-east of Marion, and it was along its swampy borders that we first saw specimens of *Magnolia Fraseri*. They were only slender little trees at that altitude, but were in full bloom. Some of the flowers were over five inches long, and each was surrounded with a rosette of the large, bright green, auricled leaves. It was interesting to note how the flowers faded to a dull leathery brown, and were reflexed back against the stem, where they remained some time before finally falling off. The Cucumber-tree (*M. acuminata*) was there also, with its much less showy, as well as smaller, flowers. It is a particularly handsome, stately tree, often seen growing to a great size along the high-roads. Staley's Creek was disfigured with a small saw-mill that has evidently perpetrated damage out of all proportion to its size. It has very successfully done away with all the larger Walnuts, Hickories and Ashes, and now White Oaks are being turned into hubs and spokes for wagon-wheels, handles for axes and hoes. Many a superb Chestnut Oak lies prostrate, bereft of its bark, great car-loads of which at Marion Station told only too plainly of the devastation in progress in the higher recesses of the mountains. On some of the hill-sides a few antiquated Chestnuts, and the tall straight trunks of the Sour Gum-tree (*Nyssa sylvatica*) are the only remnants of the older forests. The larger Nyssas were especially noticeable on account of the curious way their bark had of splitting into hexagonal sections.

The Sweet Buckeyes (*Æsculus flava*) grew along the streams, and were a fine sight, the dark bluish green of the foliage making a striking background for the splendid spikes of flowers. White-flowered shrubs were, however, at that season the most abundant. The Flowering Dogwood was in its glory, for as far as the eye could reach its snowy masses covered the hills. Some of the trees were remarkable for a very decided pink tinge to the flowers. It was more noticeable at a distance than close by, though in drying the flowers preserved the pink-streaked look of the bracts. Two White Thorns, *Cratægus coccinea* and *C. Crus-galli*, were abundant everywhere in the valley, and on the hills and along the road a few late-blooming Black Haws (*Viburnum prunifolium*) added their mite to the white festival.

The woods and swamps were filled with Violets, yellow, blue and white, too many to note separately. Among them all a pure white form of *Viola cucullata* was remarkable for its size and beauty. *Houstonia serpyllifolia*, the daintiest of tiny blue flowers, lined the borders of the little brooks with a starry growth. It was astonishing to see the size and beauty the little

flowers attained along some of the higher mountain-rills. In striking contrast in color was Phlox reptans, a pretty species of a clear rose-purple, with long trailing runners. The May-apple, or Mandrake, as it is called in many places (*Podophyllum peltatum*), was seen in every field on the edge of and in every wood all through the country. In the open it grew in dense patches, sometimes of nearly an acre in extent, and made its presence felt by its all-pervading perfume. The beautiful pink-purple and white *Orchis spectabilis* was abundant in damp woods, growing usually two or three together in a clump.

Polygonatum giganteum well deserved its name, for in many shady places the great light-green-leaved plants towered so high above us that we could look into its pretty bells. It was often found over six feet high. With it were always the Bellwort, *Uvularia perfoliata* and *Oakesia sessilifolia*. At a higher altitude above the creek on Pond Mountain, as elsewhere, between three and four thousand feet above sea-level, *O. puberula* was abundant, a brighter green-leaved and much more slender species than its two relatives just mentioned. With it on stony, dry and hot slopes the lovely Lily-of-the-valley (*Convallaria majalis*) was at home. Its habit in its native haunts is certainly very different from that which it has acquired in gardens. It stands up straight and stiff from among loose stones singly, never in dense clumps. At the same altitude, though it was also abundant in the valley, *Disporum lauginosum*, grew at its best. On one widely spreading luxuriant plant we counted fifteen of the yellowish green drooping flowers:

Along the dry summit of Pond Mountain the Virginia Snake-root (*Aristolochia Serpentaria*), with its strange, almost subterranean flowers and aromatic root, was a novelty to most of us. *Leucothoë recurva* was very abundant and very luxuriant along the top of the ridge. It is a beautiful little bush, two to four feet high, with rather straggling slender branches, and long, one-sided recurved racemes of snowy-white bells—one of the most striking of the mountain shrubs.

Early in June the valley beyond Pond Mountain was filled with Laurel (*Kalmia latifolia*), then just at its best. A large swampy tract of land filled with it, the spreading white cymes of *Viburnum cassnioides* and some delicate yellow *Rhododendron calendulaceum* made groups that any gardener would covet. The *Rhododendron* was very often met with, though with one exception never in great masses.

Five miles east of Marion, along a hollow filled with *R. maximum*, we found the rare *Carex Fraseri*. It is a singularly beautiful plant. The glossy, leathery leaves are from one to two feet long and over an inch wide, growing together in clumps and overhanging the banks of the creek, and the white spikes of flowers have somewhat the aspect of a small Blazing Star (*Chamælririum Carolinianum*). The latter, with splendid long fluffy white spikes, we found not far from where the *Carex* grew, but in more open sunny ground.

Rhododendron Catawbiense was at that time in full bloom. It grew in small clumps, isolated mostly along rocky ridges and in the lower valleys, never in great quantities. The large clusters of rose-lilac bells were very handsome. In some places the flowers were so light as to be almost white.

Along the wildest and most impassable portion of the thicket it was interesting to note some very fine tall Locust trees, which looked almost out of place in a truly wild state.

A few late specimens of the queer little *Obolaria Virginica* were still blooming, and near them a small group of the rare Putty-root (*Aplectrum hiemale*), a curious, though hardly beautiful plant. Two Lady's-slippers, the little yellow and brown *Cypripedium parviflorum* and the larger pinkish *C. acaule*, were invariably found growing together, and with the pretty little Swayblade (*Liparis liliifolia*) completed the list of Orchids growing along Nick's Creek.

Conspicuous all over the dry hillsides, where it always made a gay spot in the wood, was the brilliant Fire Pink (*Silene Virginica*). *Asclepias quadrifolia*, one of the most graceful of the Milkweed tribe, was often seen with it, and was equally pretty.

New York.

Anna Murray Vail.

Italian Garden Tools.

IN the course of a long residence in Italy, various things have struck me as novel and interesting in the horticulture of this ancient civilization, and it has seemed to me that your readers might be entertained by the same points which have attracted my attention; and to begin with, some of the implements used are so novel to American eyes, and have a character of their own so decided, that, perhaps, I may as well start with them.

The farmer in central Italy has half a dozen distinct tools which we Americans can only describe as spades; and one or two of these Tuscan varieties of the species might well find a place in our tool-houses. The Italian is an old hand with a spade. Since the days when Romulus made use of one to kill Remus, these rustic weapons have been the stand-by of the Roman farmer and his Italian successor. Plows, even the improved English article, are considered rather coarse and ineffectual substitutes for the spade. And, indeed, no plow could cut those broad, shoulder-deep trenches which are dug hereabout between the Vine-rows at least every other year. This trenching, by no means the lightest of the husbandman's labors, serves to prune the too luxuriant Vine-roots; but its chief end, in the farmer's eye, is the ventilation of the sub-soil; a process which he holds—as countless generations have held before him—to be absolutely necessary. Superstition, doubtless, has its part in this theory; still there is no question that in Italy freshly turned earth is unwholesome, and its neighborhood to be shunned, above all in the cities.

Now, for this trenching a spade like our own is sometimes used, or another with a slightly curving blade; but the favorite implement, and that which does the neatest work, has a flat blade about as long as our own and of the same width at the handle, but tapering thence to a sharp point. It can be seen at a glance, or rather at a blow, that this tool is much more easily handled than the one-edged spade, and Italians claim that this more than counterbalances its inferiority in carrying power. It is, at all events, especially adapted to the use of the contadina on her lonely farm, who else must wait impatiently till a man will spare the time to dig over her garden-plot; while on land caked by a July drought its pulverizing power cannot be overestimated. For summer weeding, it is in great favor with the Italians, who prefer to work the ground more deeply than is possible with a hoe; though here again one is often tempted to question whether so much extra labor is really necessary and profitable, or whether the reason why the imported hoes hang rusting in the hardware shops be not rather because the Roman of old made use of none such; albeit, of mattocks—the tool from which the hoe is evolved—he possessed an infinite variety. The persistence of these immemorial traditions, these elementary rules of the farming of twenty centuries—and who knows how much more?—ago, is curious, and at times rather irritating.

It puzzled me for years to understand why the Italian farmer made such a laborious business of the laying out of his grain and grass fields. Whether on stony hill-side or on fertile river-bottom, high on the slopes of the Apennines or on the scorching plains of Campania—in fact, under whatever conditions of soil or climate—I cannot now recall a single instance of grain or grass sown broadcast over a plane surface. On the contrary, after the land is, according to our notions, ready for the seed, it is divided into a series of gently rounded beds. Where space will permit, this is accomplished by means of a plow with double mold-boards, which draws a series of parallel furrows up and down the length of the field. The ordinary width of the beds so made is two or three feet, though in grass-land I have seen them six feet broad, and yesterday I passed a plot of Rye which was growing along prominent ridges about a foot apart, and a very poor show it made. In nine cases out of ten there is no need to assist the surface-drainage by this manoeuvre, and not only would the extra trouble of thus preparing the ground seem worth consideration, but it is a fashion which puts machine-labor in mowing or reaping completely out of the question. I have repeatedly tried to get some clue to this custom from the farmers themselves, but only once have I elicited any other answer than a gently conclusive "Cosi si fa" (it's the custom); and that was when an old man appended, in evident allusion to the degeneracy of our time, that the furrows used to be drawn nearer together. One day, however, I discovered in an ancient manual of farming that the Roman husbandman practiced the self-same fashion, the only difference being that he did so for a reason. His object was to prepare the ground for two crops instead of one, Beans being sown in the furrow as soon as the grain was reaped, and the ridge plowed over them, while the decaying stubble afforded all the dressing that was required in the rich Campanian soil.

The fact is, that the further afield one wanders in this country the more certain he is to be confronted by the ubiquitous ghost of Rome. Halting the other day in an unfrequented little town of Umbria, I saw among the heap of newly forged tools offered for sale by the village blacksmith a spade of a weird, wild shape, much as though a neat crescent had been cut from its blade, leaving two sharp, little horns at the corners. Now, it is obvious that, etymologically, a bidente may be anything with two teeth, from a baby down, and why

may not the Romans term *bidens*, which, under the tuition of men who rarely know one tool from another, we regularly translate mattock, but which seems to have con-noted, as the philosophers say, an immense variety of uses, have been a generic one, covering this sort of thing as well? I do not know what especial end this horned spade may serve, and would not undertake to recommend its introduction; but there is a sort of Titanic trowel, common in this region, which is a joy indeed in the way of transplanting shrubs and taking up autumn roots, for which I venture to bespeak, as for the triangular spade, an impartial trial upon our American soil.

Siena, Italy.

Louise Dodge.

New or Little-known Plants.

Aster amethystinus.

THIS noble Aster appears to have been long an inhabitant of European gardens, where, according to Gray, it is sometimes found growing under the name of *Aster pilosus* and of *Aster Bostoniensis*, although no figure, strangely enough, has ever been published of it. In the gardens of its native country it appears to be less well known, although for many years it has been included in the large collection of native plants successfully cultivated in the Botanic Garden at Cambridge.

Aster amethystinus produces hirsutulous stems sometimes five feet tall or more and widely branched above. It belongs to the *Multiflora* section of the genus as elaborated by Professor Gray, and produces many small racemously arranged heads with spreading herbaceous tips to the imbricated bracts of the involucre, and purple or violet rays. The cauline leaves are small and entire and are sessile, or partially clasp the stem by their bases.

Aster amethystinus (see p. 378) is found growing in low moist ground in Belmont, near Boston, and ranges west to Illinois and Iowa. Like all the perennial American Asters, it is an easy plant to cultivate, growing vigorously and rapidly in good garden-soil, and is easily multiplied by the division of the roots.

Foreign Correspondence.

London Letter.

CALLA PENTLANDII.—This is the second new yellow-flowered *Calla* which has appeared in English collections recently. It was shown in flower at a meeting of the Royal Horticultural Society last month, and it has since been described in the gardening journals as superior to the older *C. Elliottiana*. I believe Mr. Whyte, of Pentland House, Lee, obtained *C. Pentlandii* from a few tubers presented to him two years ago. It flowered in June, and he has since got two offsets from it. He also possesses another plant which, in appearance, is precisely similar to that which flowered. These four plants, the two large and the two offsets, were offered for sale by Messrs. Protheroe & Morris to-day, but did not change hands, although the sum of ninety guineas was bid for them. The extraordinary prices recently paid for these yellow-flowered *Callas* are tempting the Orchid collectors to visit South Africa in search of these and similar plants.

THE BLUE HIMALAYAN POPPY (*Meconopsis Wallichii*) is a beautiful plant in the rock-garden at Kew in July. Planted in deep moist peat-soil, in a position where tall trees afford partial shade in the middle of the day, it grows to a height of five feet, its tall, stout erect stem clothed with silky haired leaves a foot long and numerous axillary racemes of flowers, which expand first at the top of the stem. They are two inches across and of a soft lilac-blue color, paler, no doubt, than they are on the high elevations of the Sikkim Himalaya, but not too pale to be called blue, nor yet too flimsy to be called beautiful. Its home is the home of the Sikkim *Rhododendrons*, and its likes and dislikes in the garden are similar to those of such *Rhododendrons* as *R. ciliatum*, *R. glaucum*, etc. The Poppy ripens seeds freely at Kew, and it takes two years to grow to flowering size. The first year it is kept in a cold frame in pots.

KNIPHOFIA NORTHIIÆ.—This gigantic species of *Kniphofia* was found near Grahamstown and painted by Miss North when on a visit to South Africa in 1883. It was soon afterward introduced to Kew, where it was cultivated in the succulent house along with the *Agaves*, etc., and flowered in 1885. A stock of young plants was raised at Kew from offsets, and these were eventually distributed. Mr. Gumbleton, of Cork, obtained one, which he flowered in July, last year. It has a short, thick stem bearing a huge rosette of glaucous green leaves, four to five feet long, six inches broad at the base, tapering gradually to a long point, keelless, channeled and elegantly recurved. The inflorescence is in the form of a dense raceme nine inches long, on a comparatively short, thick stalk, the flowers an inch long, greenish yellow, the upper ones and buds tinged with red. As a flowering plant this *Kniphofia* is inferior, but as a handsome, really elegant foliage-plant it is worth a place in the garden. A fine example of it is now flowering at Kew, where, notwithstanding the excessive cold of last winter, which killed almost every one of the *Kniphofias* outside, it has stood in a south border against the Orchid house and left unprotected. It is probable that *K. Northiæ* will cross with the handsome flowered kinds. If we could obtain a plant which combined the strikingly handsome habit and largeness of dimensions of *K. Northiæ* with the tall, brilliant-colored flower-spikes of the forms of *K. aloides* (*Uvaria*), and bear the winters, at least, as well as the former, what a grand acquisition it would be. *Kniphofia* breeders, please note. *K. pauciflora* is also in flower at Kew. It is really a free-flowering plant, notwithstanding its name, and it is remarkable in having flowers of a primrose-yellow color. A figure of it prepared from the Kew plant was lately published in the *Gardeners' Chronicle*. The plant is about two feet high, with narrow arching bright green leaves, distinctly ribbed, and without marginal spines. The flowers are in loose racemes on slightly arching scapes two feet high, each flower being an inch long, trumpet-shaped, with exerted stamens. It was introduced to Kew from Natal two years ago and flowered for the first time last March. It is in flower again now. So far it has been treated as a cool greenhouse plant. While writing upon the subject of *Kniphofias* I may mention that there is a new one at Kew which is described as having handsome white flowers.

PTYCHORAPHIS AUGUSTA is a newly introduced Palm from the Andamans, of which there are young plants at Kew. It is not unlike *Cocos Weddelliana* in general appearance, a little more robust, perhaps, when it gets up, but, at any rate, a very likely plant for table-decoration, etc. The genus was created by Beccari for several East Indian Palms allied to *Ptychosperma*, and to include at least one of the *Rhopaloblustas*, of which *R. hexandra* was added to cultivated garden Palms last year. *Ptychoraphis* is easily distinguished by its grooved seeds, resembling those of the genus *Phoenix*. *P. augusta* was described as *Areca augusta* by Kurz in the *Journal of Botany*, 1875, page 332, where it is spoken of as one of the most conspicuous features of the Nicobarese vegetation, pushing its head above the highest forest-trees and forming, as it were, a Palm-forest above the true forest. It has a thin, annulated trunk one hundred feet high, and a head of unarmed pinnate leaves, each twelve feet long, the petiole clothed with short ferruginous scales, and the pinnae a yard long. The tree fruits abundantly every year. A quantity of the seeds have recently been received by and distributed from Kew. Young plants appear to thrive under ordinary stove treatment, and, as they assume an elegant appearance from the earliest stage, they are certain to become popular in the garden.

LILIUM HENRYI is much stronger this year than it was last, and as it has now stood two severe winters at Kew without protection, it may be looked upon as perfectly hardy. It is quite distinct in habit from all other Chinese Lilies; some of the plants at Kew are over six feet high.

It will be remembered that this species was introduced to Kew by Dr. Henry, and that it has yellow flowers as large as those of *L. speciosum* and not unlike them in shape.

PHALÆNOPSIS ARTEMIS is a new hybrid raised by Messrs.

media, which sprung from *P. amabilis* and *P. rosea*, but the flowers of the newer one are larger and of a clearer shade of pink.

CÆLOGYNE SANDERIANA was also shown in flower by



Fig. 63.—*Aster amethystinus*.—See page 377.

J. Veitch & Sons from *P. grandiflora* and *P. rosea*, and exhibited by them in flower at the last meeting of the Royal Horticultural Society. As might have been expected, there is a close resemblance between it and the hybrid *P. inter-*

Messrs. Sander & Co., who introduced a quantity of it about five years ago. It has large, handsome flowers, quite as large as those of *C. cristata*, in drooping racemes, pure white with streaks of chocolate running through the

patch of golden yellow on the lip. It is a first-rate Orchid, but it is not one of the best-behaved under cultivation. The plant shown bore three spikes of ten flowers each.

CALOPOGON PULCHELLUS would be a favorite garden-plant in England if it were less difficult to manage. As it is it is scarcely known to English cultivators, so that a plant of it which was exhibited in flower at the last meeting of the Royal Horticultural Society was looked upon as a novelty and was awarded a first-class certificate. The plant was one and a half feet high and bore a four-flowered spike. Most of the North American Bog-orchids behave badly under cultivation in England. They are all right the first year, but the resting season almost invariably proves too much for them. If there is any "wrinkle" known to American cultivators which would enable us to grow these beautiful little Orchids here there are many who would be most thankful to have that "wrinkle" made generally known. It must, however, be confessed that we fail equally with many of our native Orchids.

London.

W. Watson.

Cultural Department.

Strawberries, Old and New.

THE strawberry season just closed has been a fairly profitable one through this section, growers disposing of their crops at remunerative prices. Owing to the opening of a canning-factory at this place the raising of small fruits has developed to large dimensions, and prices are kept up to paying rates, as there is never a time of glut in the market, and the factory takes the surplus after the local retail market is supplied. The time was when the Crescent was universally grown, but very few of the large growers now find it profitable, although in a few favorable locations it is still the most productive variety. The Warfield, Burt's Seedling, Haverland, Eureka, Bubach and Sharpless are extensively grown, with a sprinkling of Wilsons on some plantations.

On the Station-grounds Burt's Seedling has been the standard of productiveness for the past three years, but failed this year to hold its record, owing to a severe attack of the leaf-blight (*Sphærella Fragariæ*), which disease has been more than usually prevalent the past season, and Beeder Woods took its place at the head of the list, with Greenville, a seedling from Ohio, a good second, and the fruits of which are so much larger and finer in appearance than the Beeder Woods that it is probable that the receipts from the sale of the yields of the two varieties would be in favor of the Greenville. Enhance, a variety grown on the Station-grounds for several years with varied success, has been among the most productive this year, and if the yield could be depended upon it would prove a very valuable fruit, as it is exceedingly high-flavored and very firm. The Van Deman still leads as the best very early variety, the bulk of the crop being harvested when but very few other varieties are in competition with it. It is of more than average productiveness, and on account of its brilliant color and firmness would be a desirable variety even if not early. After two years' trial of Michel's Early the conclusion has been reached that for this section it does not supersede several of the older well-known varieties. While very few of its fruits ripen extremely early, the main crop is about with Crescent, and although its quality is far superior to that variety, its dull color and softness make it inferior from a commercial standpoint. The Parker Earle, which last year proved a grand late variety, was winter-killed quite badly the past season, and in consequence gave only a medium yield. Whether its susceptibility to freezing weather is due to its southern origin or not is impossible to tell, but it is to be hoped that it can be grown through this section, as it certainly is needed for a companion to the Gandy, another fine late variety.

The new-comers tested for one year are some of them valuable, and a brief description of them may be of interest. The Bowman is a perfect flowering variety, with extra large dark green foliage; fruits light red, averaging large; the quality is very fine, but the fruits are too soft for shipment; very similar in flavor to Jersey Queen. Boynton, a perfect variety of vigorous growth, bearing immense clusters of medium-sized dark red fruits of good quality. The Barton is probably the Eclipse of several years ago; the growth of plant is all that could be desired; foliage perfectly healthy; the fruits average large, conical in shape, dark showy red in color, of more than average firmness and fine quality; very satisfac-

tory berry. Feights No. 2, a perfect-flowered seedling, sent here by the originator of the Dayton Early, proves a first-class variety; the growth of plant is very rank; foliage perfectly healthy; fruits large and symmetrical, bright scarlet, and of superb quality; this, without doubt, will become a valuable variety. Feights No. 3, a pistillate companion of the above, gave a larger yield, and the fruits averaged larger than the No. 2, but the color and flavor were lacking. Governor Hoard, a variety of stocky growth; dark green foliage; fruits large and showy, of very fine quality; the plants are above the average in productiveness, and it will undoubtedly become a valuable market variety. The Great Pacific is an Illinois seedling, coming well recommended; its growth is rank; foliage dark green and extra large; the fruits, which are of medium size, are borne in large clusters on stiff fruit-stalks well up in the foliage; berries bright scarlet, very firm, sub-acid; only fairly productive. Gillespie was sent out as a perfect-flowering Haverland; from one year's experience with it we find that, while the plants make a fine growth, it makes but few runners; the fruits are of the same shape as Haverland, with a longer neck; color lighter than the latter; berry very soft and of indifferent quality; yield poor. Hazelton's No. 4, a seedling from Delaware, Ohio, made a very rank growth and furnished a large number of runners; berries only medium size; quite firm and medium tart; yield poor. Hatfield makes a moderate growth; fruits a fair size; flavor a pleasing sub-acid; yield poor. Martha, a pistillate variety of stocky growth, of very dark green foliage; fruits dark red, of only moderate size, but having a very fine flavor; yield about an average crop. Laxton's Noble is one of the most popular English varieties, and deservedly so; growth of plants good; foliage dark green; fruits roundish conical of very dark red color; large and of very fine flavor; its only fault is the very few runners made. Lovett's Early has not proved early here; it is a vigorous-growing variety, bearing a moderate crop of very showy fruit of very good quality, but quite soft; this variety is well spoken of in other localities, and may improve here. Mount Holyoke has some of the characteristics of the James Vick, one of them being its profuse blossoming and its inability to mature over half the berries set; under high culture it may become a productive variety. The Shaw makes a vigorous growth, but does not send out runners freely; the fruits are of good size and very fine flavor. Piper's No. 4, an Illinois seedling, is of low stocky growth, with small dark green leaves, yields but a moderate quantity of conical fruit of medium size and poor quality. Sadie makes a strong growth of light green foliage; fruits are below the average in size, borne in large clusters, bright scarlet; moderately firm; quite tart; does better in stools than in matted rows. Saunders has the same faults as the Shaw, but has larger fruit; a very good garden variety. Woolverton: growth vigorous; fruits of good color, medium size and fine flavor. Walton: of moderate growth; foliage light green; yields only a moderate crop; fruits average small, light red, soft, and of good quality. Walden: this variety makes a very rank growth and matures a fair crop of fruit; berries bright red, very large, moderately firm and of fine quality; a good home berry. Westbrook: of good growth; foliage light green; fruits small, tart, and many of them imperfect. Yale: this variety is of stocky growth, with light green foliage; fruits obtuse-conic, very dark scarlet, with showy yellow seeds; quality fair; season late; this has not proved productive, although it is well spoken of elsewhere. In regard to the Gandy, spoken of earlier in this article, the fact of its being late is but one point in its favor. Here it has been above the average in productiveness. It is one of the handsomest of berries, with its large green hull, perfect shape and handsome color, while the flavor is exquisite enough to tempt few who at the end of a long strawberry season are beginning to tire of even this most delicate of fruits.

Geneva Experiment Station.

C. E. Hunn.

Southern Tomato Blight at the North.

IT is interesting to note that the blight so destructive to the tomato industry in the southern states is doing considerable damage in the north this season. A short time ago Mr. F. L. Stevens sent me specimens of diseased tomatoes from Syracuse, New York. These exhibited manifest symptoms of the southern Tomato blight, and when the central core of the wilted stems was examined it was found swarming with the characteristic bacteria. Laboratory cultures were made of this germ and inoculations of healthy stems were successful in all cases.

Mr. Stevens, at my request, made an inspection of six Tomato fields and found that three were exempt from the blight.



Fig. 64.—A Sugar Maple in Ohio.—See page 375.

Of the others, one had about three per cent. killed, eight per cent. quite badly affected, with many more plants showing traces of the disease. A second field had two per cent. killed, and about two per cent. injured. A third field showed at that time only traces of the blight.

As this trouble is evidently in the northern states it may be well to add that the infested plants first show a wilting as if there was a lack of water-supply, then lose their green color and finally die. The germ is found most abundant in the pith and growing layer of the stem. The blight does not seem to be confined to any particular kind of soil, situation or exposure. It is probable that the plants may be attacked before they are set in the fields, as well as afterward. Potatoes are similarly affected by a bacterium which is communicable to the Tomato, and the germ seems to be the same. In like manner Melons and Cucumbers are attacked by a bacterium, and it is quite likely that they are all the same, and if this be the case, it follows that a soil may become contaminated with bacteria from any one of these crops and make it unfit for any of the others. The Potato, from the nature of its "seed," is the best adapted for the dissemination of the blight, as it can be carried unobserved in the tubers used in planting. Special care should be taken with all land upon which a bacterial disease has flourished. Burn the affected plants when found and also all litter in the field at harvest-time. It is possible that the Bordeaux mixture or some other fungicide may prove effective against this minute and insidious trouble.

Rutgers College.

Byron D. Halsted.

Violet Disease.

THERE is nothing more puzzling to gardeners and florists than the Violet disease, or spot. Its ravages are widespread and unusually fatal to success. The disease seems to attack the plants, and the spores that are dormant germinate more readily when the conditions are most favorable for growth; hence the advisability of getting the plants under cover in frames or houses as soon as excessive day temperatures are past and night dews begin.

In our case failures have been much more conspicuous than successes, and perfectly healthy stock becomes badly infested soon after it is planted in our grounds.

Becoming convinced after repeated trials that starting with healthy plants was not certain to circumvent the disease, we began to try the cure for fungoid growths, as found in the various preparations of copper that are now so generally recommended. Our first trial was made last fall with carbonate of copper and ammonia, and the result was soon apparent; for the foliage perished promptly, either because the mixture was unsuitable on account of the ammonia in it, or the plants were too far gone before the remedy was applied. I think now from added experience that the latter was probably the case.

This spring we started again, with plants from five sources, planted in as many different situations as we could provide. The plants in one of the lots were badly diseased when they came, the others were part clean and part slightly affected; we used the Bordeaux mixture, and soon concluded that it had no curative effect upon diseased plants. It was better to destroy infested plants, root and branch. We have about twenty rows of clean stock planted at right angles to the row that was destroyed, and the half-dozen plants at the end of each row were badly attacked, plainly from being near the others, although all were treated alike with the mixture. All of the above are planted between rows of Celery in a soil that does not dry out readily.

We have also several other lots planted where they are shaded after noon by Elm-trees, but whether in shade or open the disease spots appear. These are dressed before they disfigure the foliage to any extent, so that we do not have to pick off any leaves, as this debilitates the plants and renders the young leaves more liable to attack.

Another point we are satisfied upon is, that the best way to secure good vigorous stock for this year is to avoid using those that were cropped during the past winter to propagate from. The better way is to let the runners grow on a part of the plants, and in fall take them off and make cuttings of them, keeping them in flats all winter, where they will grow the least and yet be free from frost. Of Marie Louise, those so treated are the best we have. It would appear that constantly propagating from plants that have been forced year after year to do their utmost in winter, has so weakened the plants as to render them unable to resist the disease when it appears.

The Lady Campbell Violet, a variety recently imported, is with us less liable to become diseased than the Marie Louise,

though, in time, it will probably be as susceptible as any other. This variety is of a light lavender-blue, similar to the old Neapolitan, but much larger, and produces the sweetest flowers of any Violet. It is sure to become largely grown when better known, for the color is much liked. The kind known locally as the Cape Cod double Violet, and elsewhere as the double Russian, is the darkest blue double Violet—fragrant, perfectly hardy here, but produces its flowers in spring only. When grown in frames it comes in just when the Marie Louise is past, and may always be had in quantity for Easter. The only objection to it is the short stems, but we keep the sashes on most of the time and syringe freely to induce a vigorous leaf-growth, and the flowers will draw up through the foliage. This variety, with The Czar, Schonbrunn, Wellsiana and Victoria (all single), we find disease-proof, and are used when the double kinds fail. The single kinds all produce a crop of flowers, and then stop flowering. The best way is to bring them in from the cold frames in succession, to keep up a supply through the winter. Most Violet-growers have a theory of their own in regard to this disease; but it does not appear to be so well known as it should be that the Bordeaux mixture is a safe preparation to use, and of decided benefit if used as a preventive. As a means of cure it is valueless, if the plants are allowed to become defoliated. There is no better way to treat plants that have lost their leaves than to burn them.

There is also another enemy to Violet-culture in the nematodes, or root-galls, which is harder to deal with than the disease of the leaves. When the plants are so attacked they refuse to grow, and the edges of the leaves have a scorched appearance; the roots are covered with small knots, caused by the nematodes, which are in the soil they grew in, either out-of-doors or on the bench of the greenhouse. To guard against this trouble we have planted the Violets in new soil outside and avoided the use of fertilizers of all kinds, simply adding to the loam a heavy dressing of decayed leaves.

South Lancaster, Mass.

E. O. Orpet.

Chrysanthemums.

CHRYSANTHEMUMS in pots will soon need stimulants in some form. When giving the final potting I leave enough space for a top-dressing in July, and after the roots have fairly used this the feeding process should begin. All will not be in condition to take stimulants at the same time, and no general rule can be laid down. Some varieties are less vigorous than others, and different plants of the same variety vary. Much, too, depends upon the kind of soil used, and whether the plants are potted firmly or loosely. In general, it may be stated that stimulants should not be applied until the plants are well rooted, and should be given sparingly, or withheld from weak varieties or delicate plants. Many of the lessons we have learned by experience in the cultivation of plants under artificial conditions are costly ones, but these are the lessons which are forgotten. Fortunately, there is no plant which will bear so much hard treatment as the Chrysanthemum, and, therefore, I have been able to remedy many mistakes before it has been too late. I had been taught that it was early enough to apply liquid-manure when the flower-buds began to show themselves, and, while I have had good healthy plants grown in this way and fair blooms, I have lost the lower leaves and have never got enough shoots to cover the naked stems. I was convinced, however, that the loss of leaves was owing to the need of nourishment after the pots were filled with roots and must have nearly exhausted the soil. In later years I have applied manures earlier, or as soon as the plants needed additional food. Two years ago some of my plants turned yellow, which I am almost certain was the result of an overdose of guano; but, by allowing them to go as dry as possible with safety and then watering only with clear water, I soon got them into a good color.

Another lesson learned was to pack heavy soil rather lightly, and light soil firmly. A heavy soil packed firmly is always either in danger of getting water-logged, or else the ball dries up so that to get it thoroughly soaked it needs to be placed in a tub of water several hours. This is important to remember when it is intended to feed up plants into large specimens. No rule can be made as to the proper date to commence and proper intervals for feeding. My plants are looking extremely well this season, and the consequence is I am using fewer stimulants. Just now I find the liquid-manure from a stable where three cows and one horse are kept is very satisfactory when diluted with thirty times its bulk of water, and this I only apply once in two weeks. Clay's Fertilizer I find the safest of commercial manures and of good lasting qualities; occasionally I alternate this with guano and some other fertilizer, at the rate of two pounds to one hundred gallons of water. I have

dropped a lump of quick-lime into my manure-tub, but I don't know positively whether it ever did any good.

When there is good drainage and a free open soil, it is perfectly safe and preferable to use highly concentrated manures which contain no solid ingredients to clog the surface as do those impervious mixtures of green cow-manure. I continue feeding until the flowers begin to expand. I have tried it longer, but do not think I gained anything.

Wellesley, Mass.

T. D. H.

Hardy Narcissus.

THE time is at hand when Narcissus-bulbs may be transplanted with safety, and often with benefit. The individuals in old-established clumps of these plants are often so cramped for space that only the outside bulbs flower at all, and often when these are lifted and replanted no flowers are produced the next season for the reason that there had not been room enough for the proper development of the flower-buds in the bulb. Some persons have therefore concluded that their bulbs came of poor stock or had deteriorated, but a season of good growth will usually put them in a condition to flower profusely.

Any one who wishes to move bulbs of the Poet's Narcissus, whether of the type *N. Poeticus*, or any of its varieties, should do so as soon as the foliage begins to turn yellow, and not wait, as is best with other kinds, until the leaves have died off completely. The reason for this is simple, and it is important that it should be understood; the fact is, that this Narcissus is never completely at rest, for new roots are produced before the old ones have decayed, and several weeks before the leaves have died down completely. Our bulbs of *N. Poeticus* and its varieties are lifted already, and in a cool airy place, where they are rapidly drying off, when they will be replanted in another situation among grass. The flowers of this section are not desirable for room-decoration in a cut state, owing to their powerful fragrance, consequently they are removed from the border and placed where they will require less attention, and also to make room for the other kinds, most of which have increased threefold in two years from planting.

When planting Narcissus I find it is a great advantage to place at least a handful of coarse sand under the bulb; the difference between bulbs so planted and others planted in the ordinary way is very strongly marked when lifting-time comes. Those planted with sand have not a trace of decay at the base, while others do show symptoms of this dread disease, though there appear no actual losses therefrom, although I was rather apprehensive of danger before taking up the bulbs in our collection of over seventy kinds. When we consider how great are the ravages of this disease in Europe, this is a matter for congratulation, but past experience has led me to the conclusion that the long dry periods we experience during the resting-season of Narcissus is a safeguard against attacks of basil-rot, and that the bulbs will remain perfectly sound if no disturbing element in the shape of decomposing fertilizers be admitted to contact with the bulbs when planted. If the texture of the soil be correct—that is, of a porous nature—then fertilizers can be applied as a top-dressing in fall, when root-action commences, and the rains will wash it down to the roots.

August is the best time to obtain bulbs when new plantings are to be made. Narcissus should be in the ground and making roots about the usual time of purchasing them—that is, when the Dutch bulbs arrive here. There is no reason why we should not obtain Narcissus as early as we do Roman Hyacinths or *Lilium Harrisii*, and dealers would be quick to respond to inquiries for Narcissus were they made at an earlier date than is the custom, and to the purchaser the results would be far better than when planting is delayed until October, for all root-growth is suspended in November on account of frost, before the bulbs have got fairly to work. If late planting must be done, a covering of dry leaves may be put over the beds, and these will keep out any but the most severe frosts almost to the end of the year in ordinary seasons, but this covering must be removed as soon as frost and snow will permit in spring, so that all growth above ground may have light and air. The question may be asked, is it necessary to keep the bulbs out of the soil for any length of time when lifting in summer, as is the custom with English growers at their annual lifting? It will bear repetition, that there is no need of lifting Narcissus annually here, but only for the sake of division. The bulbs, after drying gradually for a few days, may be cleaned of old roots and foliage, separated with care, and replanted at once, since the soil here is warm and usually dry in August, and is, therefore, a better place for storage than we could give them above ground at this season.

South Lancaster, Mass.

E. O. Orpet.

Correspondence.

A National Wild Flower Exhibition.

To the Editor of GARDEN AND FOREST:

Sir,—One of the most vivid and pleasing recollections of a recent visit to Scotland is the Wild Flower Exhibition held at Edinburgh. The principal objects of this exhibition are to engage the active energies of the young in a healthful and instructive recreation, and to enlist their sympathies on behalf of their suffering and unfortunate fellow-creatures in children's hospitals. The exhibition at Edinburgh was the fourth one held under the auspices of *The People's Friend*, a juvenile paper. The former exhibits were held in Glasgow, Dundee and Aberdeen. The distinguishing feature of the one just held is, that the exhibits have been entirely gathered by children. In all, there were over 1,700 entries, consisting of hand-bouquets, baskets, bouquets of Heather and Thistles, of Heather and Bluebells, of wild Grasses, of white Heather, of wild Ferns in rustic baskets, wreaths of wild Roses and Honeysuckles, collections of dried wild flowers, and of dried leaves of native trees tastefully mounted, crosses of wild flowers, and window flower-boxes. All, with the exception of the last class, was the work of children. These floral attractions were systematically grouped into various classes and artistically arranged upon tables in Music Hall, where they were subject to leisurely inspection.

The exhibition was opened by Sir William Muir, Principal of the University of Edinburgh, while Mr. John Leng, M. P., acted as Chairman. Upon the platform were many gentlemen of note, including several members of royalty and many of the principal clergymen of the city. Apologies for absence were received from the Duchess of Buccleuch, the Marchioness of Tweed, the Earl of Stair and others, showing the general interest taken in the enterprise.

After calling the large assembly to order, Mr. Leng said, in substance, that Edinburgh was a city of exhibitions. It was regarded, not only by Scotchmen but by all who visited it, as an exhibition in itself. They had floral exhibitions to satiety, representing all the seasons of the year. In the last week they had held a grand horticultural show, but they had never yet had a show like this one, which claimed to be unique, both in its exhibits and in respect to its exhibitors. As a wild flower exhibition it had a character of its own, and he would admit that people generally had little idea that the common wild flowers of the highways and hedges, the meadows, woodlands, hills and mountains, could be set forth with such artistic effect or could produce such a beautiful combination. The exhibition was not local in its character; it did not bring together simply the wild flowers of Mid-Lothian or the east of Scotland; it set before the visitors the entire midsummer wild flora of Scotland from the Shetland Islands to the Borders, and even beyond the Borders, for there were exhibits from England and Ireland as well. The exhibitors of these bouquets and baskets, these devices and decorations, were all children. The flowers had been gathered by their industry and arranged by their skill, so that there were represented before them the results of the labors of nearly two thousand children working with a purpose and a will, that purpose being to help their sick brothers and sisters in the Royal Sick Children's Hospital.

Sir William Muir said he believed that in many respects this would be the most charming exhibition ever held in Edinburgh. Nothing could be more pleasant than to see how the people of the country, especially the children, were interesting themselves in the growing of flowers. It was one of those objects which the public should encourage to the utmost of their power. He trusted that by this flower-show the funds of that most useful hospital, the one devoted to sick children in the city of Edinburgh, would be greatly enlarged, for the institution was well worthy the confidence and support of all interested in the exhibition. The people of Scotland owed an immense debt to Mr. Leng for having originated this idea. The exhibition was then formally declared open. During the day excellent music and dramatic recitals were provided.

The most largely patronized competition was that of the hand-bouquets of wild flowers. In this class there were two sections, junior and senior, with a grand total of no less than 800 entries. One of the principal constituents of these bouquets was the well-known Ox-eye Daisy, while the Dandelion, Poppy, Vetch, Clover, Buttercup, and other species common to the United States, were seen in profusion. The baskets of wild flowers formed very pleasing exhibits. The baskets themselves were usually rustic in character, being made of rushes, willow, bark or some similar material. The flowers in them were usually of the same general character as those in the

hand-bouquets, although many species with short stems were seen in addition. The hand-bouquets of Heather and Thistles were very numerous, and formed a pleasing feature of the exhibition. It was evident that this group appealed most strongly to the nationality of the greater portion of the visitors, and this section of the spacious hall was crowded during the whole period of the exhibition. The native Scotchman lingered proudly among these characteristic plants of "bonnie" Scotland. The bouquets of wild grasses formed another large exhibit, there being upward of 250 entries in this class. The Yorkshire Fog is the common name of a species very largely represented, but in addition to this I observed many tastefully arranged collections consisting in part of Timothy, Red-top, Crab Grass, Meadow Fox-tail, Oat Grass, Orchard Grass, English Blue Grass, Rye Grass, Sheep's Fescue, Couch Grass, Sweet Vernal Grass, etc. The boards of dried leaves of the common British trees formed one of the smaller, but quite attractive, exhibits. It served to corroborate what I had already observed—namely, the comparatively limited number of native species of British trees. The competitors in this class, however, had taken unusual pains with their collections, and they attracted a full measure of attention. In the wild Fern competition the first prize-winner had over thirty species on exhibition. These included several species each of Polypodium, Asplenium, Aspidium, Woodsia, Scolopendrium and other well-known genera.

The exhibit of window flower-boxes did not come up to my expectations, and was, I judge, a disappointment, as far as number of entries was concerned, to the promoters of the exhibition. In varieties, condition and general arrangement the exhibits in this class did credit to the competitors. Among the special exhibits were a small collection of semi-aquatic plants, growing very thriftily in bottles. There was also exhibited a branch of the Forthingall Yew, which is now over 200 years old, and a large collection of home-made rustic flower boxes and stands, some of which were of elaborate design and exquisite workmanship.

The exhibition continued during the afternoons and evenings of two days, the visitors numbering between four and five thousand. The admittance was only six cents, and the total receipts, including the sale of the exhibits at the close, was over \$1,200.

Nearly all the flowers were sold, as those present were glad to purchase some little floral souvenir of the occasion, and knew this to be a simple but effectual method of aiding a cause whose needs are great and whose claims on general sympathy are strong. The expenses of the exhibition were paid by the proprietors of the *People's Friend*, so that every penny that was paid for flowers or at the door went to the hospital.

Edinburgh, Scotland.

William R. Lazenby.

A Tropical Plant-house.

To the Editor of GARDEN AND FOREST:

Sir,—Forty-two years ago, M. H. Simpson, Esq., of Saxonville, Massachusetts, who died a few years ago, built the first greenhouse in this vicinity. Like the one built by H. H. Hunnewell, Esq., of Wellesley, Massachusetts, it was devoted to the culture of grapes. Greenhouses were novelties in those days, and luxuries which very few could afford. Both these houses are of the same pattern, having curved iron roofs, the materials for which were imported from England. Sir Joseph Paxton was in the zenith of his fame then, and these curved iron roofs after his designs were very common. While very substantial, the main objection to setting glass in iron base is the unequal contraction: hence the glass can never be kept close and secure against cold. The original Grape-vines at Saxonville, and at Wellesley too, are yet in bearing. The varieties are nearly the same at both places, and comprise Black Hamburg, Black Prince, White Fontignan, Black Fontignan, Buckland's Sweetwater and Muscat of Alexandria.

A tropical plant-house was the conception of the son, F. E. Simpson, Esq., and was built in 1886, by converting a lean-to Peach-house into a span roof, and adding an ornamental circular end. It is nearly one hundred feet long by thirty wide, with a twenty-feet ridge. The plan is to show tropical plants to the best advantage. Small specimens are grown on low benches along the sides, which allows the use of the entire centre for large specimens. Such an arrangement permits of the disposal of unsightly tubs and pots by plunging them in the ground, while many specimens are planted out entirely, thus giving an opportunity for the proper development of many species which do well in no other way.

Among the many fine specimens the following Palms are noteworthy: *Areca lutescens*, *Cocos Weddeliana*, *Geonoma gracilis*, *Sabal umbraculifera*, *Pritchardia filamentosa* and

Ptychosperma Cunninghamiana. There was a well-developed specimen about six feet high of the handsome foliaged *Sphærogyne latifolia*, with leaves twenty by fifteen inches, and also a smaller specimen of its lovely companion, *Cynophyllum magnificum*. It is admitted by most gardeners as difficult to keep the foliage of these splendid stove-plants free from injury; these under Mr. Hemenway's care, however, are models of perfection. *Dracænas* are evidently more at home here than I have had the fortune to find them elsewhere. Whether the soil, or the water, or the conditions under which they are grown, is the main element of success is a question. Mr. Hemenway thinks it is all owing to a peculiar kind of compressed bog turf, which, it must be admitted, he uses with considerable success with a great variety of plants, including Orchids. A specimen of *Cypripedium Laurencianum*, well in bloom, was exceptionally thrifty. The roots were thoroughly matted through—ample evidence that the plant was at home in the material in which it was growing. Whether it is the soil or not, the conditions for the culture of *Dracænas* were perfect in every other particular—plenty of shade and moisture, equable temperature, all possible in a large structure. *Dracæna fragrans* happened to be in bloom at the time of my visit. The odor filled the house. It resembles Orange-blossom, but is more agreeable, more delicate. This is one of the easiest and quickest growing species and makes elegant specimens up to ten feet, having long, broad, graceful leaves.

D. Knerkii, evidently a variety of *D. Draco*, the Dragon-tree of the Canary Isles, make fine specimens with leaves touching the ground on a specimen eight feet high. *D. Rumpfii* is another which is very distinct; the leaves turn abruptly downward very shortly after being matured. The elegantly variegated form of *D. fragrans*, named *Lindenii*, was in fine condition, the coloring being exceptional for so large a specimen, as it is well known this variety goes "green" after it grows two to three feet high. The collection of *Cordylines*, mostly varieties of *C. terminalis*, is very bright; with the introduction of so many new varieties, many of them scarcely distinguishable from the older sorts, it is difficult to keep them correctly named.

Marantas are perfectly at home here. *M. Zebrina*, one of the oldest and best, measured five feet high from the ground, more than five feet in diameter, with leaves more than two feet long. Other gorgeous specimens were *M. princeps*, a very distinct-looking variety growing about three feet high, with a lighter stripe of green along each side of the midrib. *M. Massangeana*, *M. Makoyana*, *M. pulchella*, *M. Vander Heckii* and *M. virginalis* were among others. *M. Veitchii*, a comparatively rare species, may be compared to a giant *M. Makoyana*, having the same peculiar oblong markings of pale green, showing very distinctly through the dark green and purple shades of the body of the leaf. There were several handsome Aroids, among them an unusually fine specimen of *Phyllotœnium Lindenii*, its large brightly variegated foliage being in marked contrast with the fine, darkly shining leaves of *Alocasia metallica*. *Anthurium Crystallinum* and *A. Warocqueana* were among the collection. *Fittonia Verschaffeltia*, with green leaves and a violet-colored network of veins, and variety *argyroneura*, white, with green network, both in large masses alongside of the paths, made a very appropriate edging, with here and there a pan of *Hoffmannia refulgens*, a curious Rubiaceous plant from South America, with short-jointed creeping stems, thickly clothed with beautifully ribbed brownish egg-shaped leaves about two inches long, which are covered with shining transparent hairs, giving it a peculiar lustre. Scattered among the Palms and other large specimens are many fine tree-ferns, notably *Alsophila australis* and *Cibotium regale*, and also dwarfier-growing species, including *Adiantum formosum*, *A. macrophyllum*, *A. Farleyense* and *A. trapeziforme*. A wall, about ten feet high, on the north side of the tropical plant-house, which separates it from a fernery, is clothed with the common *Ficus repens*, and set in this are elegant brackets for suitable plants and drooping Ferns, and a very pretty effect they make. The wall on the fernery side is covered with a mixture of rough peat and Sphagnum moss held in place with galvanized wire netting. In this are planted various Ferns, *Selaginellas* and numerous *Begonias*, principally belonging to the *Rex* family. The necessary moisture is obtained through a perforated pipe carried along the top, and a very pretty effect it makes. In the house itself is a collection of many species and varieties of *Adiantums*, mostly allied or related to *A. cuneatum*. *A. bellum*, a native of Bermuda, is worthy a special note, its handsome crested foliage being especially striking.

Wellesley, Mass.

T. D. Hatfield.

Notes.

Throughout this month, in the woods and along the country roads, the graceful Clematis Virginiana, with its white star-like blossoms, will convert every unsightly stump and ragged fence into a bower of beauty.

The little Rosa foliolosa of the south-western states should not be omitted in a list of late-flowering Roses. It is of very dwarf habit, and has so far not produced sufficient bloom at the north to be showy.

The American Trumpet Creeper (*Tecoma radicans*) has been in bloom for a fortnight, while its Japanese relative, *T. grandiflora*, is just beginning to open its large showy blossoms. The flowers of *T. grandiflora* are larger in size, richer and purer in color, than those of the native plant (see GARDEN AND FOREST, Vol. iii., p. 393). Both plants are constantly visited by humming-birds through their long blooming season.

On the road from Khandala to the famous Cave of Karli, in India, says Miss North, in her recently published *Recollections of a Happy Life*, she came upon "a splendid tree of *Jonesia Asoka* full of orange-flowers and delicate leaves. The priest of the temple found me one fine flower growing through a honeycomb full of honey, which had been built round its stem. This was a very curious thing." She adds: "Did the buds push their way through the honey and wax, or was the thing built quickly round them? I never satisfied myself which was the first perfected."

In France the common name of the China or Indian Pink (*Dianthus Chinensis*) is likewise "China Pink"; that of the Clove Pink and its offspring, the Carnation (*D. caryophyllus*), is "Florist's Pink," and that of the Sweet William (*D. barbatus*) is "Poet's Pink." Another popular French title for the last-named flower is "Ready-made Bouquet," which is charmingly expressive, and is more musical in French—Bouquet tout fait—than in English. And still another is "Jealousy." Comparing this with "Sweet William," one is tempted to fancy that some ancient story of a love-lorn maid may once have been currently connected with this flower in both France and England.

There is nothing absurd in the idea that the removal of the tassel from Indian Corn should increase the crop, provided enough were allowed to remain to fertilize all the ears. The development of the floral organs of a plant is a great strain on its vitality, and the strength saved might be diverted profitably, it would seem, to the development of the fruit. Experiments on this point, however, have given varying results, and some tests lately made at the Cornell Station show neither loss nor gain in Corn production. It was found, however, that the pollen and anthers in an acre of Corn contained 6.01 pounds of nitrogen, or an amount equal to that in a liberal application of a good commercial fertilizer.

Writing her "Impressions of Alaska" in the June *Bulletin of the Torrey Botanical Club*, Miss Cooley says, with regard to the profusion of berry-bearing plants in the forest-region near Loring: "We found strawberries, salmon-berries, two species of trailing *Rubus*, *R. stellatus* and *R. pedatus*; high blackberries, low blackberries, a raspberry, and four species of gooseberries and currants, all edible; *Sambucus racemosa*, of which the Indians are fond; *Viburnum pauciflorum*; *Vaccinium Myrtillus* and *ovalifolium*; the red blueberry, *V. parvifolium*; the Salal, so highly valued; a pleasant small cranberry and *Vaccinium Vitis-Idæa*, almost as good—enough for man and beast—Klinget and bear and duck. I gathered nineteen of the twenty edible berries which a Chilcat missionary told me are to be found. Of these the salmon-berry, gathered in the summer and preserved for winter use in salmon oil, is most valued. It is a large salmon-colored or orange raspberry, very delicious when picked and eaten fresh from the bushes, though disappointing if bought from the Indians on the wharf, where the aroma of oil that pervades everything Klinget clings to them."

The formal lines of the Maguey plantations, writes Mr. Sylvester Baxter in a recent number of the *American Architect*, running all over the landscape, often as far as the eye can reach, give the country a sort of decorative appearance, but it is too suggestive of tattooing to be picturesque. We use the terms, barren and fertile of aspect, customarily, in an absolute sense, the latter being associated with thick, dark soil and the luxuriance of green meadows and flourishing Corn-fields. Again, certain regions are proverbially known as barren, and their aspect becomes identified with the mental imagery of the word. Cape Cod, for instance, is one of these regions, but in reality the sandy peninsula is one of the most fertile portions

of the country, made so by its Cranberry-culture; swamps, once worthless, now bear hundreds of bushels of cranberries to the acre. So with the thin-soiled peninsula of Yucatan, which annually exports millions of dollars' worth of Henequin, or Sisal Hemp. These dry, wind-swept high plains of the Mexican table-land, bare and brown, desolate and barren as they may look to the stranger, are also wonderfully fertile. Some of these great estates are said to yield net revenues of more than \$100,000 annually, and the two railways, the Mexican and the Inter-oceanic, derive a most lucrative traffic from this region, running special pulque-trains into the capital every morning. The other railway lines also get a considerable traffic in carrying pulque from the capital to regions in the interior where the beverage used to be an unknown luxury.

In a letter contributed to *The Nation*, the organ of the Nationalist party of Ireland, in 1849, Carlyle writes: "Every patriotic Irishman—that is, by hypothesis, almost every Irishman now alive—who would so fain make the dear old country a present of his whole life and self, why does he not, for example, directly after reading this, and choosing a feasible spot, at least plant one tree? That were a small act of self-devotion; small, but feasible. Him such tree will never shelter. Hardly any mortal but could manage that; hardly any mortal, if he were serious in it, but could plant and nourish into growth one tree. Eight million trees before the present generation run out; that were an indubitable acquisition for Ireland, for it is one of the barest, raggedest countries now known; far too ragged a country with patches of beautiful park and fine cultivation, like shreds of bright scarlet on a beggar's clouted coat—a country that stands decidedly in need of shelter, shade and ornamental fringing, look at its landscape when you will. Once, as the old chroniclers write, 'a squirrel (by bending its course a little and taking a longish leap here and there) could have run from Cape Clear to the Giant's Causeway without once touching the ground'; but now eight million trees, and I rather conjecture eight times eight millions, would be very welcome in that part of the Empire." The editor comments upon Carlyle's fundamental unacquaintance with Irish affairs, and points out how hopeless it was to reforest a country where, if a tenant planted his tree or sapling and tended it until it became a mature tree, the law declared it to be the property of the landlord without a scrap of compensation to the man who reared it.

From Mr. Lafcadio Hearn's article, called "In a Japanese Garden," published in the July number of the *Atlantic Monthly*, we quote the following: "The garden contains no large growths. It is paved with blue pebbles, and its centre is occupied by a pondlet, a miniature lake fringed with rare plants, and containing a tiny island, with tiny mountains and dwarf Peach-trees and Pines and Azaleas, some of which are, perhaps, more than a century old, though scarcely more than a foot high. Nevertheless, this work, seen as it was intended to be seen, does not appear to the eye in miniature at all. From a certain angle of the guest-room looking out upon it, the appearance is that of a real lake-shore with a real island beyond it, a stone's-throw away. So cunning the art of the ancient gardener who contrived all this, and who has been sleeping for a hundred years under the Cedars of Gesshoji, that the illusion can be detected only from the zashiki by the presence of an ishidōrō, or stone lamp, upon the island. The size of the ishidōrō betrays the false perspective, and I do not think it was placed there when the garden was made. Here and there at the edge of the pond, and almost level with the water, are placed large flat stones, on which one may either stand or squat, to watch the lacustrine population or to tend the water-plants. There are beautiful Water-lilies, whose bright green leaf-disks float oilily upon the surface (*Nuphar Japonica*), and many Lotus-plants of two kinds, those which bear pink and those which bear pure white flowers. There are Iris-plants growing along the bank, whose blossoms are prismatic violet, and there are various ornamental grasses and ferns and mosses. But the pond is essentially a Lotus-pond; the Lotus-plants make its greatest charm. It is a delight to watch every phase of their marvelous growth, from the first unrolling of the leaf to the fall of the last flower. On rainy days, especially, the Lotus-plants are worth observing. Their great cup-shaped leaves, swaying high above the pond, catch the rain and hold it awhile; but always after the water in the leaf reaches a certain level the stem bends, and empties the leaf with a loud splash, and then straightens again. Rain-water upon a Lotus-leaf is a favorite subject with Japanese metal-workers, and metal-work only can reproduce the effect, for the motion and color of water moving upon the green oleaginous surface are exactly those of quicksilver."

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLES:—The Pinetum at Wellesley.....	385
The Wellesley Plantations.....	385
An Old House in New Jersey. (With figure.).....	386
By Bicycle to the Waverley Oaks.—II.....	386
Notes on the Flora of Smythe County, Virginia.—III.....	388
NEW OR LITTLE-KNOWN PLANTS:— <i>Pterostyrax hispidum</i> . (With figure.).....	389
FOREIGN CORRESPONDENCE:—London Letter.....	389
CULTURAL DEPARTMENT:—Notes on Shrubs.....	390
Cape Oxalis.—I.....	392
Notes on Stove-plants.....	392
<i>Euphorbia pulcherrima</i>	392
<i>Coreopsis monstrosus</i> , Carnation Cyclops.....	393
THE FOREST:—Forestry in Prussia.....	393
CORRESPONDENCE:—Hardy Plants in Flower at Short Hills, New Jersey.....	394
Home-made Linen.....	395
Albinos among Orchids.....	395
Local Plant Names in New Jersey.....	395
NOTES.....	395
ILLUSTRATIONS:— <i>Pterostyrax hispidum</i> , Fig. 65.....	389
The Old Meeker House at Lyons Farms, New Jersey, Fig. 66.....	391

The Pinetum at Wellesley.

THE collection of coniferous trees which Mr. Hunnewell has been forming during the last forty years on his estate at Wellesley, in Massachusetts, is unsurpassed in the number of species and varieties of these trees that it contains, and in the size and beauty of individual specimens. Much has been said and written in the last few months of the injury sustained by conifers in the eastern states during the past winter, which was an exceptionally severe one for these plants; and in order to throw some further light on the subject, we have asked Mr. Hunnewell to furnish us with the dimensions of several of the most important trees in his collection, that our readers may realize the variety of conifers which can be grown in the New England climate, when they are planted in soil suitable to their requirements, and are carefully cultivated.

The soil at Wellesley is admirably suited to conifers, the subsoil being a light porous drift gravel which insures perfect drainage. The surface soil is naturally light loam, but has been enriched and greatly strengthened by the liberal use of peat on which Mr. Hunnewell feeds his plants. They have all received the best cultivation and are generally growing in sheltered positions, so that they have received, on the whole, exceptionally good treatment.

The tallest tree in the collection is a Norway Spruce (*Picea excelsa*), planted as a small nursery plant in 1852; it is now seventy-eight feet high, with a trunk circumference, taken eighteen inches above the ground, of nine feet. A White Pine (*Pinus Strobus*), planted about the same time, is only fifty-six feet high, the trunk girding, at the same distance from the ground, nine feet six inches. *Abies Cephalonica*, planted about 1860, is forty-two feet eight inches high, with a trunk six feet in circumference, eighteen feet from the ground. *Abies Nordmanniana*, planted about

the same time as the last, is forty-two feet in height, the trunk girding only four feet six inches. *Abies concolor* (the California form or *Abies lasiocarpa* of gardens), probably planted about 1870, is twenty-eight feet high, with a trunk four feet in circumference. Another plant of the same species, known as *Abies Parsonsii*, and also Californian, is twenty-eight feet high, with a trunk four feet five inches in circumference, while a third plant, also of California origin, and incorrectly called *Abies grandis*, is twenty-six feet six inches in height, with a trunk four feet seven inches in circumference, all Mr. Hunnewell's trunk measurements being eighteen inches above the ground.

Of the Colorado *Picea pungens*, there are a number of specimens raised from the seed collected by Dr. C. C. Parry, the discoverer of this fine tree in the autumn of 1862. The tallest is thirty-three feet six inches, with a trunk circumference of three feet. A beautiful blue specimen is thirty-one feet high, with a trunk circumference of three feet four inches. *Pseudotsuga taxifolia*, imported from England, and of California or Oregon origin, and planted about 1865, is thirty-six feet high, with a trunk four feet in circumference. This plant grows in an exceptionally sheltered and favorable position, which accounts for the fact of its hardiness, the extreme western form of the Douglas Spruce usually proving too tender to withstand the climate of New England. The largest specimen of the trees of this species raised by Mr. Hunnewell from Colorado seed, collected also in 1862 by Dr. Parry, is now twenty-five feet five inches in height, with a trunk three feet in circumference.

Among other notable specimens, planted about 1870 or subsequently, are plants of the Japanese *Picea Ajanensis* (*Picea Alcoquiana* of gardens), twenty-one feet in height, with a trunk three feet six inches in circumference; *Picea polita*, seventeen feet in height, with a trunk three feet in circumference; *Abies brachyphylla*, twenty-two feet in height, with a trunk four feet in circumference; *Abies Veitchii*, fifteen feet high, with a trunk two feet eight inches in circumference; *Abies Cilicica*, thirty-one feet in height, with a trunk four feet in circumference; *Abies orientalis*, thirty-three feet in height, with a trunk three feet six inches in circumference, and one of the handsomest and most satisfactory trees in the whole collection; *Pinus Koraiensis*, twenty-two feet six inches in height; *Pinus Lambertiana*, eighteen feet in height; *Pseudolarix Kämpferi*, twenty-one feet in height, with a trunk three feet six inches in circumference; *Retinospora obtusa*, twenty-two feet in height; *Retinospora pisifera aurea*, nineteen feet in height; *Retinospora filifera*, fifteen feet six inches in height; the Japanese *Larix leptolepis*, certainly one of the finest specimens, if not the very finest in cultivation, fifty-four feet in height, with a trunk three feet in circumference.

Among smaller specimens, there are fine plants of *Abies Apollinis*, *Tsuga Sieboldii*, *Taxus cuspidata*, from Japan, the best member of the genus for eastern North America, where it is perfectly hardy and very beautiful; *Sciadopitys*, *Thuyopsis dolabrata*, now well established; *Thuya Japonica* (the *Thuyopsis Standishii* of gardens), a hardy tree of much promise; *Picea Omorika*, the newly discovered Spruce of south-eastern Europe; *Abies pectinata*, *Abies Pinsapo*, of doubtful hardiness; *Abies firma*, of Japan; *Abies nobilis*, *Abies magnifica*, and *Abies amabilis*, trees of the Cascade and Sierra Nevada Mountains, which will not thrive in New England unless planted in unexceptionally favorable localities and tended carefully. The collection contains, too, all the well-known forms of *Retinospora*, and many forms and varieties of *Thuya*, *Taxus*, *Tsuga*, etc. The Pinetum proper contains about four hundred specimens, although conifers have been planted outside it in nearly all parts of the estate.

THE Wellesley plantations have a wider interest than that which arises from their dendrological value. The opinion is general that the sole reward of one who plants

trees is a distant hope that some one will enjoy them in after years; that tree-planting is a constant sacrifice of the present for the remote future, and that the highest good a tree-planter can hope to attain is a discipline in the virtues of patience and faith. This view is based on the fundamental error that no tree gives pleasure until it attains its full development, which comes, perhaps, after a century of growth. It would be quite as true to say that parents never enjoy the society of their children until after they become of age. The fact is that the planter finds the keenest delight in the companionship of his trees when they most need his care and are constantly expanding into new beauty under his attention. To the genuine lover of trees the tiniest seedling makes an appeal as direct and personal—though not as strong, of course—as does a Pine or Oak which is crowned with the associations of a century. But even the impatient American, who wants his full-grown forest at once, need not mourn as one without hope. Mr. Hunnewell was approaching middle age when he planted his first trees, and yet they attained stately proportions long ago. They are still improving, and will give increasing pleasure to his successors, but to him they have brought their own reward from day to day and from year to year since the hour when the gardens of Wellesley were planned.

And what a reward it has been! A refreshment from the cares of business that has never for a moment palled or failed—a stimulus for the mind, a wholesome recreation for the body. Hundreds of visitors enjoy the beauties of Wellesley every year, but to none of them are these beauties as fresh as they remain to the man who has created them and has been for years familiar with their changing phases all the season through. In the stress of business-life active men need some diversion, and certainly it is prudent to choose one of which we are not likely to grow weary. Mr. Hunnewell can testify with regard to the one he selected, that he has enjoyed it with a zest and relish that have grown keener every year. Nature is ever young. All her processes are expansive and replete with promise. One whose chosen companions are growing things has found the spirit of perpetual youth, with all its enterprise, exhilaration and hope. There was no selfish thought in the design, nor has there ever been a selfish thought in the maintenance of the Wellesley Gardens. For forty years they have been a public means of instruction and delight, and they will continue to attract visitors as long as there is any appreciation of horticultural taste and skill. But, like all good work, this has not been without its appropriate influence upon the doer—an influence which has helped to give the planter of the Pines of Wellesley the generous enthusiasm, the sunny and hopeful temper, the refinement and simplicity of character which are most thoroughly appreciated by those who know him best.

An Old House in New Jersey.

A RECENT number of this journal (vol. v., p. 367) contained a picture of the house at Morristown well known as the headquarters of Washington during the Revolution. As a companion to this fine example of colonial architecture we give to-day (see page 391) one of the few surviving houses constructed in the earlier, or pioneer, period of New Jersey history. Lyons Farms is just without the suburbs of both Newark and Elizabeth, and although the air vibrates with the roar of two cities this hamlet has been left in an eddy as "improvements" of various kinds have swept by on either side, and it wears an aspect of old-fashioned respectability which is quite in contrast with the upstart suburban smartness which prevails all about it. There are few places in the United States where the old Meeker house would not look out of place, and, to tell the truth, it seems a trifle antiquated even in Lyons Farms. No one knows just when it was built, but its present possessor has evidence that a direct ancestor of his, as well as of the artist who made the drawing here reproduced, was born in it in 1677. It is noteworthy that its present owner

and occupant, Mr. William Grumman, holds it by inheritance, as all its former proprietors have done. The property has never been transferred by deed, but has descended directly from parent to child for seven successive generations from the original Meeker, who held his patent from the Crown.

The roof of the old house has been renewed, but the cedar shingles on the outer walls have remained where they were fastened with curious hand-wrought nails more than two centuries ago to testify to the durability of this wood. They were rived from the trees which once stood on the Newark Meadows—a forest whose remnants are remembered by many men still living. Apparently they never have been painted, but they have not decayed. Weather-worn they are, however, until in many places they are almost scoured away by the action of wind and storm, and the texture of their soft gray fuzzy surface bears little resemblance to that of the original wood. The house is still in fair repair within, and the double doors still swing on the heavy strap-hinges on which they were first hung. Some of the rooms are wainscoted with plank of Tulip-poplar and the heavy beams are scarcely seven feet above the floor.

The surroundings of this relic are quite in keeping with it. The great stone beside the well-curb is hollowed out into an ample basin, in which the family, after the fashion of an elder day, were wont to cleanse their hands and faces in the morning, while the well-sweep, the ancient sun-dial and sundry other details complete a picture which more closely resembles a homestead of the seventeenth century than any other with which we are familiar.

By Bicycle to the Waverley Oaks.—II.

HERE we are with the Waverley Oaks close by. The stream is Beaver Brook, celebrated by Lowell in one of his noblest poems. And now, as when he wrote, "Warm noon brims full the valley's cup." Some people call it Clematis Brook, but the name by which Lowell knew it is preferable. The brook forms the boundary between the town of Belmont and the city of Waltham, and the Oaks are within the limits of the latter place. The Oaks themselves are not conspicuous from the road, but a striking landmark is formed by a gigantic ruined Elm, with a grandeur like that of a crumbling old castle in its decay. It thrusts up its great gray branches out of a dense thicket by the brookside.

Mr. Lorin L. Dame describes this tree in *Typical Elms and Other Trees of Massachusetts*. "At all seasons of the year great trees are good to look upon," he says. "Some are finest when enveloped in clouds of green; others when stripped, like athletes, their mighty arms bared for conflict with the elements. This tree is most impressive in autumn, when its leaves are turned to bright yellow, and the glints of sunlight play upon a trunk of singularly tender color—one of the most poetic grays of the New England landscape."

The place is a typical old New England pasture, with some of the most characteristically beautiful features of such a landscape. We enter on the Waltham side of the brook, leaving our bicycles by the roadside, and stroll along the meandering course of the striking glacial formation known as a "kame," which forms a remarkable geological feature of the locality. Along the base of the kame Beaver Brook flows on its way to the Charles. We soon come upon the Oaks, dispersed over the undulating fields in informal groups, and with the park-like effect that an open sylvan landscape gives. I can do no better than quote Mr. Dame's description:

"The Waverley Oaks are scattered over an area of several acres upon the pasture-land sloping to the brook. Some of them drink of its waters, while others grow upon the sides of the long kame, its most appropriate adornment, 'their deep roots piercing the gravel deposits to the alluvium beneath.' While solitary Oaks as large as these are not uncommon, it is not likely there is another group of such noble trees within the eastern states. With one exception, they are White Oaks, now twenty-five in number. Strength, endurance, fixedness are theirs—sylvan virtues conspicuous even more in winter, when the snow lights up the scarred trunks and the great limbs stand naked against the sky. The sturdy individualism characteristic of the Oak pushes now and then to the verge of eccentricity. Each differs from its fellows; each is worthy the

pencil of the artist; as a whole they admirably illustrate the variant types of the species.

"Southward of the kame the photographer finds a marvelous theme in a shallow pool beset with Asters and tall grasses. At the water's edge, an inverted Oak, the solitary Swamp White Oak (*Q. bicolor*) of the group, stretches downward to an inverted sky. Five feet from the ground it measures twelve feet six inches in circumference; its height is sixty-five feet. Although this Oak, as well as its neighbors, fruits freely, there are no middle-aged or young trees. Were their successors ready to take the place of the falling veterans a part of the fine impressiveness of the scene would be lost. . . .

"It has always been a source of wonder how these trees escaped the ship-builders of Medford, to whom the big Oaks in their vicinity, one after another, fell victims, at a time, too, when the Middlesex Canal was transporting ship-timber that had been floated down the Merrimac from the remote wilds of New Hampshire. It is thought that a dispute with regard to ownership, the details of which are not definitely known, had something to do with their preservation at this critical period.

"The age of these trees, some of them apparently in the full vigor of their maturity, others lightly touched by time, some falling into decrepitude, who shall tell? The trees from time to time prostrated by the wind have been found to be hollow. Agassiz, it is said, roughly estimated the age of one of these at a thousand years. If the rings are to be taken in evidence, a more conclusive judgment is attainable. Some forty-five years ago one of the smaller Oaks was cut down, probably to assert ownership, and the rings, which were counted by Mr. Lowell, numbered over 750. In the light of this revelation Agassiz's estimate comes quite within the range of probability. The largest, and presumably the oldest, of the group may well have sheltered Leif Ericsson beneath its branches, and must have been at its best when Columbus rediscovered America. It stands upon the northern slope of the kame, is about fifty feet high, and measures, five feet from the ground, eighteen feet seven and a half inches in circumference, enlarging to some twenty-eight feet over the swell of the roots. It throws out at broad angles huge irregular branches; one enormous limb, the strength of whose mortising is the architects' wonder, pushes northward more than fifty feet. It was once much longer, perhaps twenty feet, when the mighty trunk, working to its full capacity, sent the life-giving sap to the remotest twigs.

"A huge stump marks the site of a whilom neighbor of this Oak, a great Buttonwood, admired by our fathers. Its prostrate forks still lie along the stream. The old Elm, conspicuous from the highway, is now a picturesque ruin, while the Oak, which has already outlived three or four generations of Buttonwoods and Elms, has in it the promise of decades of life."

These Waverley Oaks have long had a place strong in the affections of the people here, and are a favorite resort for many lovers of nature. The poet Lowell, in particular, was strongly attached to them. The proposition to secure their preservation for public enjoyment dates something like twenty years back. Some of the painters connected with the Boston Art Club then urged their purchase by that institution as a sketching-ground for Boston artists, as Fontainebleau serves for Paris. Fontainebleau, however, is not comparable with the Waverley Oaks in any of the elements of landscape-beauty.

An effort was recently made to secure the place for the Trustees of Public Reservations. The reason assigned by Mr. Dame as probably the one why the Oaks escaped the axe of the Medford ship-builders—a dispute in regard to title—appears to be the true one, since the same reason, fortunate in the first instance, has, unfortunately, prevented their purchase, it having been found that a clear title could not be given to the property. The only hope now appears to lie in exercising the right of eminent domain, and therefore it is felt that in case the Metropolitan Park Commission report a scheme that meets with legislative approval the taking of the Waverley Oaks with certain adjacent features of the landscape should form one of the main elements thereof.

Both in natural features and situation the place is peculiarly well adapted for a public pleasure-ground. It possesses the attractions of remarkable and varied landscape-beauty, scientific interest, both geological and botanical, and the charm of personal association with the memory of a great and noble poet. The population in the neighborhood is increasing rapidly; it lies within the limits of the important factory city of Waltham; Boston and Cambridge are near by, and the two railways running past could, by the establishment of a station, take and leave passengers upon the grounds.

The grand old Oaks, whose frequent dead and naked limbs betray the neglect they are suffering, might, by treatment similar to that which has rejuvenated so many decrepit old trees at

the Arnold Arboretum, be restored to perfect health and assured a vigorous life for centuries to come. The landscape-features of the region are ideal for the creation of a pleasure-ground of rare beauty. The surface contours are beautifully molded, from the meadow coursed by the meandering brook to the fine proportions of the kame, which somehow recalls the modeling of a great sculptor.

Beyond the road to Waltham, which passes above, there rises the stalwartly rounded slope of Helmet Hill, a clean-edged mantle of woodland flung across it beyond, and giving to the grassy portion the effect of a fair shoulder. It would be well to include a portion of this hill, at least, in the park for the sake of the view, which is beautiful and extensive, and, by all means, the land on the other side of Partelo Road, embracing the course of Beaver Brook, as far as, and including, the mill-pond and cascade. This should be done both for the sake of Lowell's memory and for the unsurpassed combination of sylvan and pastoral scenery that would thereby be obtained.

I had never before visited the cascade and did not know exactly where to find it, though aware that it could not be a great distance away. So we determined to follow the course of the brook. This proved no easy task, for the ravine is well wooded, and, besides being rough with granite boulders, moss-grown and slippery in the deep shade, it has a thick undergrowth of the Spice-bush—Snapwood they call it on Cape Cod, because of its very brittle twigs. I remember the copious draughts of "Snapwood-tea" which were given me as a child when I had the measles, for the shrub is deemed an excellent febrifuge, says Gray. As we passed through the thicket the warm, moist air was filled with a very agreeable aromatic odor from the bruised leaves and broken branches.

The musical splashing of falling waters rose above the plaint of the rippling brook as we pressed onward. Soon we found ourselves looking up at the cascade; not a mill-dam, as we expected, but a natural water-fall, the brook tumbling in sturdy, irregular bounds over the same granite ledge that has for ages broken it into a mass of lace-like foam. The mill of Lowell's poem has vanished, with the wheel that tossed "armfuls of diamond and of pearl," and we no longer behold this portion of the picture:

Beneath a bony Buttonwood
The mill's red door lets forth the din;
The whitened miller, dust-imbued,
Flits past the square of dark within.
Swift slips Undine along the race
Unheard, and then, with flashing bound,
Floods the dull wheel with light and grace,
And, laughing, hunts the loath drudge round.

The "busy, never-ceasing burr" has at last ceased for ever. "Sweet Beaver, child of forest still, heaps its small pitcher to the ear," but now it no more "gently waits the miller's will." Hardly a vestige of the mill is now left. For the rest, the place remains as when Lowell described it:

Climbing the loose-piled wall that hems
The road along the mill-pond's brink,
From 'neath the arching Barberry-stems,
My footstep scares the sly chewink.

The high dam itself, as one looks up to it from the cascade, appears a "loose-piled wall," and the comparison of the pretty little pond, placidly snuggling in the woodland, to "a small pitcher" is an apt one.

We found Mill Street running close by, and had we known this fact it would have saved us the toilsome scramble through the thicket. Those readers who wish to visit the place will do well to remember this, and leave the road just after passing a rather modern and prosperous-looking cottage on the left.

The cascade is one of the few in the neighborhood of Boston, and the facility with which it may be included in a glorious park, exceptionally rich in natural features of striking beauty, makes it particularly desirable that the opportunity should be seized. The two portions of the park separated by Partelo Road, including the Oaks and the cascade respectively, could be easily united by raising the road so as to span the brook by a graceful arch, through which a footway might be carried beside the stream and bordering it through the glen to the foot of the cascade.

Boston.

Sylvester Baxter.

"Petty sinuosities and all sharp turns in the course of roads or walks are undesirable; and it should be possible to go from any point in a park to another distant point without excessive indirectness of course; certainly, without so doubling on a course as to produce an impression of a return to the starting-point."

Notes on the Flora of Smythe County, Virginia.
III.

POPULAR tradition declares that the distance from Marion to White Top Summit is twenty-eight miles, and even the most hardened mountaineer calls it the very worst road in the state, and looks upon the ascent of the mountain as an achievement for a lifetime. Most of the residents of Marion took what they called "that 'ere company" for a party of full-fledged lunatics, when they learned that we meditated its ascent a second time, having already spent three nights upon the summit.

Our traveling outfit consisted of two wagons—one fairly strong, drawn by a team of good horses, the other bearing a perilous resemblance to the "deacon's one-hoss shay" toward the close of its magic century. The team, however, was good, though the driver was not a man of brilliant intellect. Neither of the men, born and bred in Marion, had ever been on the mountains, and both would infinitely have preferred to stay at home.

It was on a dull day during the last week in May that we started. The road was passably good till we began the ascent of Iron Mountain, which was crossed at an altitude of over three thousand feet in a driving hail-storm. Along the gap, among the Hemlocks, there was a small grove of White Pine and beautiful thickets of *Rhododendron Catawbiense* intermingled with Mountain Maples (*Acer spicatum*), Striped Maples (*A. Pennsylvanicum*) and great hedges of the luxuriant Purple-flowering Raspberry (*Rubus odoratus*).

The road on the descent of Iron Mountain winds for two or three miles along White Top-tree Creek; the many small brooks that feed it run through dense forests consisting for the most part of Hemlock. Some of the trees are magnificent specimens, three to four feet or even more in diameter, and tower above everything else in the gloomy ravine, where *Rhododendron maximum* made an impenetrable tangle, individual plants being over twenty-five feet in height and tree-like in character. *Kalmia latifolia* was there also in great abundance, quite respectable little trees, with the gnarled, picturesque aspect of old Apple-trees. At that season, however, the only conspicuous tree in flower was *Magnolia Fraseri*. Many of them must have exceeded the fifty feet given as their height in *Gray's Manual*, for in some instances they seemed to rival the giant Hemlocks themselves. These made a picture to be remembered long. All along the gorge the straight, slim Magnolias, their light green leaves glistening with the rain-drops from the sudden shower, stood out in such clear outline against their dark evergreen background that each graceful, perfect flower seemed conscious of its beauty. For several miles at each turn of the road we saw a series of lovely tree-groups, and though, of course, there were many other interesting and remarkable trees, Chestnuts, Maples, Oaks and Tulips, the remembrance is only of the Hemlocks and Magnolias.

At a fork of the road we missed the right turning, and in consequence had to endure six miles, instead of two, of the roughest of corduroy roads; our "one-hoss shay," unlike its famous prototype, breaking down on an average every two hours. We were unable to reach the mountain that night, and took refuge in a small wayside inn near Green Cove on the North Carolina border, some twelve miles by the road from the top.

Near the spring where our hostess kept her milk-pans and great stone jars of butter, we found an antique *Kalmia* that has survived many winters. It was about twenty-five feet tall, and at six inches from the ground measured seven feet and two inches; at one foot from the ground four feet and three inches in circumference. It was not yet in bloom, but its magnificent proportions compelled our admiration.

Among the plants not collected before, nearer Marion, was *Phacelia fimbriata*, with charming little white flowers, a smaller and more delicate species than *P. Purshii*. With it along a little mountain stream was the tiny spring beauty, *Claytonia Caroliniana*, in fruit. The woods were all second growth, and, with few exceptions, large trees were seldom seen. A thousand feet or so below the summit we passed through a belt of Spruce-trees growing in a deep black loam bog. *Clintonia umbellata* grew there in great beds and was at its best; *C. borealis* was just beginning to show its pretty green bells, and unusually large specimens of the yellow Adder's-tongue (*Erythronium Americanum*) were still blooming. *Streptopus roseus*, with its tiny rosy bells, was plentiful; the delicate white *Thalictrum clavatum* grew along every little rill and ditch, as did also a particularly large and handsome swamp form of *Viola cucullata*.

Of all the swamp flowers, however, the most conspicuous and luxuriant was *Anemone trifolia*. This charming little plant, so long confounded with *A. nemorosa*, has rather an interesting history, which has recently been published by Dr. Britton in one of the *Memoirs of the Torrey Club*. It was collected twenty-five years or more ago by Mr. Canby on the Salt Pond Mountain, and again by Mr. Curtiss on the Peaks of Otter. It had been considered a distinct species, but on comparing it with the European *A. trifolia* it was found to be identical, and republished as such. Two years ago we found it in great abundance in flower and fruit in the localities mentioned above, and all through the higher altitudes of the Smythe County mountains we found it this year in even greater quantities, and especially fine in the great swamp on White Top. The plant stands mostly six to eight inches high, and sometimes even higher, and has in every way larger and coarser leaves and larger flowers than the frail little Wood Anemone of the northern lowland woods.

The Spruces were neither very old nor very large trees, and their very ancient appearance was caused by the luxuriance of the moss and lichen crop with which their trunks and branches were covered. Above the Spruce-swamp, on the edge of the road, stood a venerable Birch, one of the remains of the older forest on the mountain—a great gnarled old trunk that measured at three feet from the ground within two inches of twenty-three feet in circumference. Some twenty feet or more from the ground the main trunk was separated into four great erect branches, each a large tree in itself.

Range after range of billowy forest-clad mountain-tops of ever-increasing height, with the Roan and Grandfather mountains for a somewhat hazy background against a cloudless mid-day sky, was the sight that greeted us as we came out of the woods on to the great open field at an altitude of over 5,600 feet. The mountain-slope was not precipitous, but the great semicircle of North Carolina mountains lay apparently just at our feet. The grassy, rocky field, many acres in extent, the grazing-ground of many cattle, spreads right and left of the little group of cabins, where we stayed that night. The actual summit is covered with a dense forest of Black Spruce (*Picea nigra*). The grass is strewn with Violets and little low Strawberry-blossoms, and above, near the trees, the dainty little Carolina *Claytonia* was blooming, while the fragrant Trailing *Arbutus* still lingered in the dense shade. Under the Spruces we walked nearly knee-deep in luxuriant mosses, and the Cryptogamic collection was very large and most interesting. On the topmost cliff *Rhododendron Catawbiense* hardly showed signs of color on its great buds, though along the valleys we had collected and seen it in bloom for a couple of weeks. From those rocks we saw three white-flowered shrubs and trees blooming in the valley below: *Amelanchier Canadensis*, the Service-berry of the natives, its fruit already tinged with red; the Wild Red Cherry (*Prunus Pennsylvanica*), a graceful little tree covered with slender-pedicelled, delicate white blossoms, and the crowning glory of the whole, the Hobble-bush (*Viburnum lantanoides*), its great *Hydrangea*-like creamy cymes shining among the dark evergreens "like a good deed in a naughty world."

Some of the moss-covered boulders were overgrown with clumps of the Fetid Currant (*Ribes prostratum*), a pretty shrub notwithstanding its rather forbidding name, which, however, is well merited.

Early the next day we started on the return trip by a shorter and somewhat better road. On the south-east side of the mountain the white Baneberry (*Actæa alba*), the Blue Cohosh (*Caulophyllum thalictroides*), with strange, inconspicuous little greenish and brownish flowers, and the Umbrella-leaf (*Diphylleia cymosa*) had for a distance complete possession of the woods. The *Diphylleia* is a tall, handsome plant, with large, coarse, roundish peltate leaves and small cymes of white flowers with bright golden-yellow stamens. Along the road two yellow Umbelliferous plants were abundant, the small *Zizia Bebbii*, and the larger, more showy *Thaspium barbinode*. At a somewhat lower altitude we found a thicket of *Menziesia globularis*, with what in the Manual is called *Vaccinium corymbosum*, var. *pallidum*. The Blueberry is a slender shrub, with flat, spreading, very light green leaved branches and very full clusters of greenish white bells. The Pipe-vine (*Aristolochia Siphon*) grew high over shrubs and up on trees, and was covered with its strange little brown flowers.

During the latter part of the descent we were caught in another storm, and reached Marion at nightfall in a drenched condition. The luxuriance and almost abnormal growth of the mountain vegetation are not to be wondered at when the rainfall is taken into consideration. The day without a thunder-storm or sudden, short shower was a rarity, and a three days'

drought happened only once during our six weeks' sojourn in the county.

New York.

Anna Murray Vail.

New or Little-known Plants.

Pterostyrax hispidum.

THE genus *Pterostyrax*, which is now composed of three or four ligneous species of China and Japan, is closely related to our American *Halesias* or *Snowdrop-*

The character of the inflorescence of *Pterostyrax* is shown in the accompanying illustration on this page, made from a photograph of a branch of *Pterostyrax hispidum* which flowered profusely last year in the Arnold Arboretum, where it was introduced several years ago from France, and where in a sheltered situation it has grown into a small tree now ten or twelve feet in height.

Pterostyrax hispidum is quite generally distributed in the northern parts of Japan and in central China where, according to Dr. Henry's notes, it becomes a tree fifty feet in height. The flowers, which are pure white and individually small, are produced in this country from the middle to the end of June.

Foreign Correspondence.

London Letter.

AT the meeting of the Royal Horticultural Society held on Tuesday last (July 26th), there were an unusual number of interesting and new plants exhibited. The bi-monthly meetings of this society have now become the generally recognized "parade-ground" for new and rare plants of all kinds, nurserymen as well as amateurs sending all their new introductions and new productions to be submitted to the various committees. This is as it should be. We now feel certain that every new plant of any promise in England is likely to be sent to these meetings to be judged by the committees and reported upon in the various horticultural papers.

ORCHIDS.—There were some plants of very exceptional interest among the several collections exhibited, the best being from Messrs. Hugh Low & Co., of the Clapton nurseries. *Cattleya Schilleriana*, var. *Lowiana*, is like the type in every respect except the color of the labellum, which is almost wholly of a clear lilac-blue; like that of *Zygopetalum Mackayi*. As a *Cattleya*, it is a plant of more than ordinary interest. *Sobralia Lowii* is a variety of *S. macrantha nana*, with flowers of a rich rosy crimson color. Mr. Norman Cookson exhibited three handsome hybrid *Cypripediums*, namely, *C. Bryan*, raised from *C. lævigatum* and *C. argus*, and resembling *C. Morgania*, except that the petals are shorter and the spots upon them larger; *C. Youngianum superbum*, raised from *C. Veitchii* and *C. lævigatum*, is another hybrid similar in appearance to *C. Morgania*, and is really handsome in the form and color of its flowers; the third one is *C. Tautzianum*, the parents of which were *C. barbatum* and *C. niveum*. It has a large well-formed flower, with broad flat segments, the color pale rosy purple, darker on the labellum.

A spike of *Stauroopsis lissochiloides* (*Vanda Batemannii*), from the gardens of F. Wigan, Esq., of East Sheen, was much admired for its rich colors; it measured two and a half feet in length and bore ten open flowers with as many buds, each flower being two inches across, very fleshy and colored with rich purplish rose on the back, bright citron-yellow in front with brown-red spots, the lip being crimson. Although



Fig. 65.—*Pterostyrax hispidum*.

trees; indeed, Bentham and Hooker, in the *Genera Plantarum*, united the two genera, but we follow Professor Gray in believing that "the terminal paniculate inflorescence, quinary flowers, and thinner, smaller fruit" is sufficient to keep the two genera apart.

not an uncommon Orchid in collections, this plant is only rarely flowered in England. *Dendrobium Leanum*, from the same collection, may be called a variety of *D. Phalænopsis*, with narrower segments than the latter. *Eria vestita* is a rare and handsome Orchid, of which there was a fine example, a yard high, with three stems clothed with leaves from the base upward and bearing five racemes of flowers. The whole plant is clothed with conspicuous reddish hairs, and the flowers are colored flame-red.

Cattleya Rex was shown in flower by two amateurs, and both plants were good. There can be no doubt now of the distinctness of this *Cattleya* from all others. It has the pseudo-bulbs and leaves of *C. Gigas* and a scape six inches long bearing four flowers, the sepals of which are three-fourths of an inch wide, the petals an inch in width, and the lip about the size of that of *C. Percivalliana*, very wavy and crisped; the colors are rich red-brown in the throat, crimson in front, with numerous reticulating lines of gold. The flower is more like that of the rare *C. iricolor* than any other known to me. The Messrs Linden are to be congratulated on having introduced such a distinct and handsome flowered *Cattleya*.

NEMISIA STRUMOSA.—This is a beautiful-flowered Cape annual, which was shown in quantity by Messrs. Sutton & Sons, of Reading. It is a charming plant, less than a foot in height, with lanceolate leaves and terminal heads of flowers, each flower an inch in diameter, and colored almost every shade except blue. This plant was a centre of attraction to gardeners, and was generally voted a first-rate addition to annuals for the open border. *Nemisia* is a genus of about twenty species of South African plants, belonging to the *Scrophulariaceæ*, and allied to *Antirrhinum*; indeed, some of them were once included in that genus. Only two of them have previously been tried in gardens, but they are poor compared with this new-comer, which Messrs. Sutton & Sons have introduced direct from the Cape. It is very remarkable in the wide range of color in its flowers.

CRINUM SANDERIANUM is a very handsome stove-plant, and apparently an easy one to cultivate. It was introduced by Messrs. F. Sander & Co. in 1884 from Sierra Leone, and described by Mr. Baker. It is a close ally of *C. scabrum*, a common plant in tropical Africa, and *C. Kirkii*, a fairly recent introduction from eastern Africa. These are all large-bulbed, with short necks, glossy deep green leaves and erect scapes from one to two feet high, bearing umbels of from four to six flowers. In *C. Sanderianum* the flowers are large, with a curved tube six inches long, and broad lanceolate-connivent white segments, colored deep red along the midrib or keel. A plant of this *Crinum* has lately been an attraction in the stove at Kew. *C. Americanum*, a handsome species from the southern United States, is also in flower. It is a first-rate plant for beds in large stoves; at any rate it has stood in a bed in the Palm-house at Kew for the last ten years, and has flowered annually. It has an erect scape two feet high, bearing an umbel of four white flowers with narrow spreading segments and very fragrant. *C. Moorei* is at its best in the conservatory, and *C. capense* is in full flower in the borders outside.

HÆMANTHUS KATHERINE is a very handsome stove bulbous plant, and as easy to cultivate as the *Eucharis*. It is scarcely known in gardens, notwithstanding the enormous size and rich colors of its flower-heads, and the fact that it was introduced from Natal in 1877 and is easily propagated by means of offsets and seeds. Growers of bulbs for the European and American markets might do worse than plant largely of this *Hæmanthus*, the finest by far of all the species known.

GLOXINIAS.—Messrs. Sutton & Sons are the possessors of an extra-large flowered and otherwise attractive strain of these plants. They exhibited two named kinds at the last meeting of the Royal Horticultural Society which were favorably noticed, their names being: Her Majesty, with erect, very large, pure white flowers, the finest white yet seen; Duke of York, also erect, very large and white out-

side, deep crimson inside, with a broad, well-defined margin of pure white. They also sent some prettily reticulated varieties.

MR. ECKFORD'S SWEET PEAS were a charming exhibit. I noted four of the best, which are: Emily Eckford, rich violet; Blanche Burpee, pure white; Peach-blossom, rich blush-rose, and Ovid, rosy crimson. Another noteworthy one was named Stanley, the flowers of which were deep vinous purple, almost too dark in fact. I believe these named Sweet Peas come true to color from seed. Mr. Eckford supplies them in sealed packets at from a shilling to half-a-crown a packet. Mr. H. Cannell exhibited a collection of his large double-flowered *Begonias*, arranged in a novel manner, each flower being mounted with *Adiantum* and *Asparagus*, and forming a really pretty button-hole bouquet. A lecture by Mr. A. J. Manda, of the United States Nursery, Hextable, on insectivorous plants, was the means of bringing to the meeting several fine collections, comprising *Nepenthes*, *Sarracenias*, *Droseras*, etc. Mr. Manda himself staged a very creditable group of small specimens, and the *Nepenthes* from Messrs. Veitch & Sons were exceedingly good, the cream of them being *N. Burkei* and its variety *excellens*, *N. Curtisii*, and, of course, *N. Mastersiana*, which still retains premier position among cultivated *Nepenthes*.

CARNATIONS.—A special exhibition of these was held at the Drill Hall last Tuesday, and was a great success, the flowers, generally, being above the average, while the plants were mostly good in foliage and flower. The best Carnation in the whole show was Dr. Hogg, exhibited by Mr. C. Turner, of Slough, and the best Picotee, Mr. Douglas's Favorite. Mr. Turner's first prize collection of plants in flower comprised the following: Romulus, Iona, Mrs. L. Jamieson, C. Henwood, King of Scarlets, Duchess of Sutherland, Ruby, Favorite, Mr. Clements, Victory and Mrs. Nicholay. Mr. Douglas also took first prize for twelve trusses of one kind of Carnation with *Oriflamme*, a seedling border Carnation with large full flowers of a rich carmine-red color, in my opinion the most meritorious garden-plant in the whole lot. Another beautiful border Carnation is Colin de Haselvillo, with rich scarlet full flowers on stout stalks. Our exhibitions of florists' flowers are often spoiled by old-fashioned fads. A Carnation is a beautiful flower, seen at its best when on the plant and supported only by the ordinary stake and bast-tie, but it is a miserable object seen at its worst, cut and laid out on a disk of white paper and deprived of half its petals, the remaining half being arranged regularly and flattened out. And yet the latter is the recognized way to set up a Carnation-flower to be judged and admired. These dressed and collared flowers are worthless to every one except the florist showman; they are not Carnation-flowers at all in fact, and a bunch of natural flowers direct from the plants is worth a bushel of such "faked" productions.

London.

W. Watson.

Cultural Department.

Notes on Shrubs.

THERE are several species of midsummer-flowering *Clematis*, distinct from the large-blossomed Florida or Jackmanni types, which, although long known to cultivators, are not very often met with in American gardens. The large-flowered and very showy species are now well disseminated and the older varieties advertise themselves. It has not taken many years to make almost every amateur gardener in the land familiar with such a plant as *C. Jackmanni*.

Some smaller-flowered species and varieties with colored flowers are in a manner quite as interesting as their more showy congeners, and are well worth more general cultivation in our gardens. *C. Viticella* is probably better known than most of them, but it is quite uncommon here. Although a slender-looking vine, it grows freely and tall, and will thickly cover a pillar or trellis or low wall with light graceful foliage, and with flowers nearly two inches in diameter, which expand most abundantly from about the end of June until the end of July. The flowers are ordinarily of a reddish purple color,

the outside being paler. They are not appreciably fragrant. There are a number of forms with variations in the color of the flowers, some of them being quite pale, or the sepals may be dark on the outer ends, changing to almost white at the base, and there are one or two forms which have double flowers. There are not many kinds of *Clematis* with colored blossoms which bear flowers in greater profusion, and it is perfectly hardy in this climate without any protection.

A very pretty and interesting little sub-shrubby species is known to botanists as *C. aromatica*, although it is probably more generally known in nurseries and gardens under the name of *C. cœrulea odorata*. It is not a climber, the stems only attaining a height of four or five feet, but requires a slight support in order to keep in an erect position. The flowers are a couple of inches across, the four sepals of a rich dark purple color, even darker than the great flowers of *C. Jackmanni*, and they have a sweet delicate odor. The sepals are narrow, becoming much reflexed after full expansion of the flower. The stamens are white, long and freely spreading. The plant seems quite hardy here, flowers freely from the latter part of June until the end of July—there are still a few stray flowers (August 3d)—and it requires the same treat-

in best bloom during July, but which differ from the foregoing species in having flowers which do not expand their sepals widely, but are narrowly inversely bell-shaped or vase-shaped. Although natives of our own country they are extremely rare in our gardens, the large-flowering showy sorts receiving almost all attention. These American species, while not brilliantly showy like the others, are extremely interesting, and some of them bear very pretty flowers.

Clematis coccinea is one of the most curious as well as one of the most attractive of them all. A native of Texas and the south-west, there seems to be no question of its hardiness here if given a warm well-drained soil, but it does not show the vigor and tenacity of life of some other species. Its flowers are almost top-shaped, or inversely bell-shaped, with the tips of the sepals only spreading slightly and forming a very small mouth. The color of the outside, which is perfectly smooth, is a bright red or scarlet, the small exposed interior portion light yellowish. The sepals are so thick and fleshy that they suggest edibility, but they are spongy and almost tasteless. The stems of the plant ordinarily grow about five or six feet in height.

Clematis crispa grows somewhat larger, and its sepals ex-

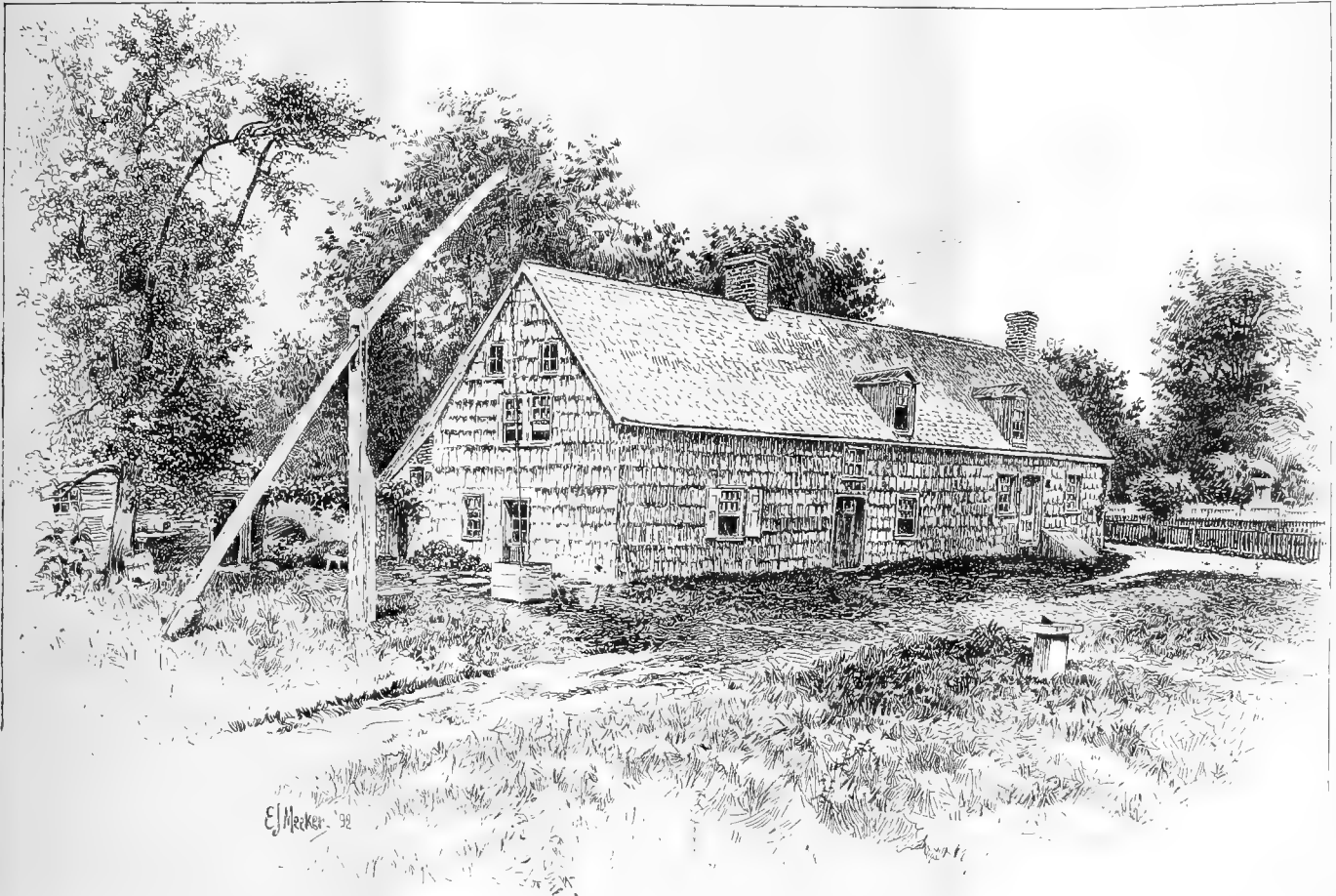


Fig. 66.—The Old Meeker House at Lyons Farms, New Jersey.—See page 386.

ment as other sub-shrubby or herbaceous species like *C. recta*. It is curious that the native country of this *Clematis* is unknown.

Another desirable species of much the same habit, but of somewhat larger, stronger growth, and which blossoms during about the same season, is known to us as *C. Eriostemon*. It has deep blue-purple flowers about two and a half inches across, composed of four thick strongly nerved sepals, which spread into a broad bell-shape, not becoming quite horizontal. The blossoms have a slightly sweet fragrance and are produced in abundance singly on long stalks, and when in good condition the plant is quite showy and attractive. It is perfectly hardy without any special care or protection, and is well worth more general use than it now enjoys. Wherever it is cultivated it is probably better known under the garden name of *C. Hendersoni*, while *C. Chandleri* is also said to be another synonym. Some years ago the Arboretum received a very pretty form from Herr Max Leichtlin, labeled *C. Eriostemon Spachiana*. This bears pinkish purple or very pale magenta colored flowers, the color deepening toward the base of the sepals.

We have several hardy native American species, which are

pand and recurve much more than those of the last species. Its flowers are very markedly ribbed on the outside, and they are of a very pretty pale lilac or light purple color. Its sepals are much thinner than those of the other.

These two kinds are the most beautiful and best deserving of cultivation among these peculiar American species. Several others are interesting, though not generally so pretty or so much admired.

Clematis Viorna, the so-called Leather-flower, with reddish purple blossoms, is well worth cultivating with the others, while *C. Pitcheri* will prove one of the most vigorous plants of all. The flowers of this are usually large and of a dull purplish color, the inner side of the sepals being very dark. It is a free-blooming species, but not showily ornamental. It appears to vary considerably in the size and depth of color of the flowers on different plants. Lavallée, in his celebrated monograph, described as *C. Sargentii* a plant which appears to be only an extreme form of *C. Pitcheri*, having small flowers and unimportant modifications in the leaves.

Arnold Arboretum.

J. G. Jack.

Cape Oxalis.—I.

THE greater part of the winter-blooming Oxalis now in cultivation are natives of the Cape of Good Hope, whence most of them were introduced a century ago, principally by Masson. In this article I wish to describe a group of species and varieties characterized by showy and generally large flowers and by glossy black bulbs, which are coated, inside the outer skin, with a sticky black matter and taper to a sharp point at each extremity, so that root-end and stem-end are indistinguishable from each other in a dormant bulb. How many of these forms are true species I am not botanist enough to decide, though it is very plain to those who have observed them under cultivation that some which are known by distinct names are but varieties of the same type.

Probably the best known of this group is *Oxalis versicolor*, which is a very beautiful little species with tufts of small leaves, each composed of three narrow leaflets, from among which rise the flowers on stems long enough to raise them well out of the foliage. These are about as large as a dime, pure white on the inner face (except the yellow of the throat, common to nearly all species of the genus) and striped with crimson on the outer edge of the back of each petal. When the flower is in bud this edging appears as a crimson spiral, and greatly enhances the attractiveness of the plant. In this description I have had in mind the best form of the species, for there are two other inferior varieties (given as species by Jacquin), *Elongata* and *Tenuifolia*. It is the last-named which is generally sold as *Versicolor*; its flowers are much smaller than those of the type, and their petals are narrow instead of broad; the leaves are smaller and of a darker color. I could get nothing but this from many different sources, and at last obtained the type, some eight years ago, from Van Houtte's nursery. I do not know where it can now be found. The variety *Elongata* is a trifle larger in flower than the type, but, as the crimson edging is absent or nearly so, it is less attractive. It is, of course, well known that many other species are marked with red exteriorly, but in *Versicolor* alone is this marking brilliant enough to be ornamental.

Oxalis variabilis, in all its forms, is one of the most pleasing species. Its leaflets are broad, of a deep green often of a bluish cast, and its flowers, when well grown, are an inch and a half in diameter. Jacquin gives the white form as the type, though his figure seems to represent the white variety of *O. purpurea*. The white *Variabilis*, which I am sorry to say I have lost, is perfectly pure in color and appears in profusion all through the winter. *Variabilis rubra* also blooms abundantly for many months; its color is very bright and fresh, very unlike that of Jacquin's plate. A difference between these varieties is that the leaflets of *Rubra* have very few, if any, fringing hairs, while *Alba* had, as I remember it, very many. I have two other varieties, *Simsii* and *Longiscapa*, red-flowered kinds of no particular interest.

Oxalis grandiflora was made a species distinct from *Variabilis* by Jacquin on account of the redness of the under side of the leaflets, which in *O. variabilis* is green, but I do not find this redness constant. Yet there are differences evident enough in the growing plants, for the flower-stalks of *O. grandiflora* are longer than in *O. variabilis*, and the flowers have less substance; there is a difference also in the color of the leaves.

Oxalis purpurea is a fine species with several good varieties. Its general aspect is much like that of *O. variabilis*, but it is of somewhat larger growth, its flowers being often over two inches across, especially in the type. Jacquin's figure gives the color as intense red-purple, approaching crimson-lake, but it is not so. A somewhat bluish purple is the true tint. Its variety *Laxula* differs from the type by its vivid crimson leaf and flower-stalks, which add much to its beauty. The variety *Alba* is the largest white-flowered kind, but its white is somewhat tinged with purple. This is a very handsome kind. *Rosea* and *Lilacina* are varieties whose distinctive color is expressed by their names. The species *Laxula* figured by Jacquin, a white-flowered kind which he thinks may be a variety of *Purpurea*, is unknown to me.

Oxalis breviscapa, which I had for a few years, and which I lost by that pest of small-bulb growers, mice, is a very interesting kind by reason of the shortness of the flower-stalks and the bright tan-colored under sides of the leaflets, two features which give the plant an unusual appearance. *Rigidula* is another very pretty white-flowered kind.

There are several other species belonging to this group of which I will say nothing because I have not yet been able to obtain them.

Like other Cape bulbs, all species of *Oxalis* can be carried safely through the winter in a cold frame; but the species named in

this paper (except *O. versicolor*) are the hardiest of all, since they cannot only be planted out-of-doors in October, with a slight covering of leaves, with perfect security, as can several other species, but they will then bloom profusely in May, as other kinds will not do. It is best, however, to grow them as pot-plants, for we are apt to forget small things in the open ground, and a few days of great heat and dryness speedily destroy the little plants. Rather let them be potted, about six in a six-inch pot, at the end of summer, and be put in a sunny place indoors; then, with proper attention, such as house-plants usually have, they will be beautiful until spring. I hope hereafter to write of some of the other species with which I have had experience.

Canton, Mass.

W. E. Endicott.

Notes on Stove-plants.

MEDINILLA MAGNIFICA.—This handsome species makes a valuable addition to any collection of stove-flowering plants in which large specimens are admissible, and, though not by any means a new plant, is still uncommon enough to attract much attention when exhibited. *M. magnifica* is a strong-growing plant of shrubby habit, with large ovate leaves, the latter being dark green and of somewhat leathery texture. The flowers are produced in pendulous racemes from the tips of well-ripened growth, and are rose-pink, the upper portion of the raceme being also more or less clothed with pink bracts, which add much to its showiness. To secure a good result from this plant it should be grown under similar conditions to those furnished to *Ixoras*—that is, plenty of heat and moisture during the growing season, and a somewhat less amount in winter, the flowers usually appearing in spring or early summer. Propagation by cuttings is not difficult, providing the wood used for the purpose is not too hard, single-eye cuttings being a good method to use in the operation.

RUDGEA MACROPHYLLA.—This is another strong-growing stove-plant, and also long in cultivation, but seems even more uncommon than the *Medinilla*, to which it is a good companion plant to the above, thriving under the same treatment. It is also an erect-growing shrub, and has large oblong-ovate leaves on which the veins are quite prominent; the flowers are cream-colored and are produced in dense erect panicles from the tips of the shoots. *Rudgea* is also propagated by means of cuttings, which root in a reasonable time if placed in a warm propagating-frame. The best soil for either of the above plants is a light loam, well drained, and enriched with some old manure, but if the only available loam is of a clayey character it is best to mix some peat and sand with it in order to make a more open soil.

PAVETTA BORBONICA.—This is another unusual plant in the average collection, though well deserving to be more widely known, and is said to be related to the *Ixoras*, though grown for its handsome foliage rather than its flowers. The leaves of *P. Borbonica* are opposite, from six to ten inches long and two to four broad, their ground color being olive-green, on which the yellowish white spots appear to advantage, while the midrib is reddish. The leaves of this plant are glossy and very attractive, especially when it is grown in a single-stemmed plant to a height of two feet or more, and well furnished with foliage. A high temperature is best for *Pavetta*, with abundant moisture, and, in order to secure the best coloring of the foliage, abundant light should be given. A mixture consisting of two-thirds loam to one-third peat and some sand makes a satisfactory compost, and the pots should be well drained. It is propagated by cuttings, which should be placed in light peaty soil in a rather close propagating-frame, but even under the most favorable circumstances these cuttings will take a considerable time to root, perhaps from two to three months.

Holmesburg, Pa.

W. H. Taplin.

Euphorbia pulcherrima.

UNDER its garden name of *Poinsettia pulcherrima*, this very showy winter-flowering plant has long been known and valued by many growers, but it must be admitted that so striking a subject deserves even wider distribution. Since the introduction of various forms of this species the time of flowering has been much extended, so that with proper management the blossoming-season can be prolonged from November to April, thus giving a supply of these brilliantly colored bracts during the whole of the dullest season of the year. As already intimated, it is in the bracts surrounding the true flowers of *Euphorbia pulcherrima* that the special beauty of this plant is found, and in well-grown specimens the head of such bracts attains a diameter of twenty to twenty-four inches,

and becomes a truly dazzling mass of scarlet. In order to secure such results generous treatment is necessary, and should be begun early in the summer. Care should be taken that the plants do not become dry, and they should be shifted on as the roots require it. The soil should be a rich light loam, in which a liberal allowance of dry cow-manure should be mixed, and after repotting the plants should be carefully watered for a week or two until the roots take hold of the new soil.

During the summer *E. pulcherrima* may be stood outdoors, this inducing a more stocky growth, but I think it advisable to place the plants in such a location that they can be covered with some sashes during rainy weather, for, when exposed to too much rain, they are apt to lose the lower foliage, and a long naked stem is no addition to their beauty. Some growers adopt the less troublesome plan of planting *Euphorbias* out in the open ground during the summer, but one great objection to this method is found in the fact that they do not lift well, the growth being soft and sappy, and, consequently, much foliage is lost in the operation if the weather should prove unfavorable. But, whatever method be adopted, it is not wise to allow these plants to remain outdoors after the nights become cool in the fall, for they are quite susceptible to cold, and a check of that character will result in smaller bracts.

After blooming, the old plants may be laid away under the benches in a warm house, and they will not require any water until it is time to start them into growth again in the spring, when they should be pruned back hard, and shaken out before repotting. Cuttings may be made of the old wood secured at the time of pruning, or from young shoots from three to six inches long, taken off with a heel of harder wood attached, the latter placed in a close propagating-frame and carefully protected from the sun, and they will with proper attention soon make roots. The young plants secured by the latter method will make a useful size for conservatory decoration during the following winter, providing they are potted on when necessary.

In addition to the type there is a double-bracted form of this plant known as *E. pulcherrima plenissima*, the whole centre of which is filled up with a crowded mass of smaller bracts of similar color to the original species. The form in question, one of the discoveries of the veteran collector, Mr. B. Roezel, created quite an excitement in the horticultural world at the time of its introduction, between fifteen and twenty years ago. The bracts of the double form are more lasting than those of the type, and, if water is not allowed to collect in the flower-heads, they may be kept in good condition on the plants for fully two months.

Another handsome variety is *E. pulcherrima major* (also known as *E. rosea carminata*), in which the bracts are of medium size and of a pleasing shade of carmine. There is also a variety with white bracts, but this is inclined to be weedy-looking, and is but little grown at the present time.

Philadelphia, Pa.

H.

Coreopsis monstrosus, sent out recently by a Continental nurseryman, proves to be an improved form of what is usually known in gardens as *C. lanceolata*, but which is correctly *C. grandiflora*. The foliage is identical, and the variety is a very vigorous grower, a small specimen received early in the year forming now a large plant. The flowers are of a deep yellow, and somewhat larger than the type. The individual petals are very broad, from three-fourths to seven-eighths of an inch broad. As compared with other plants which represent the best hitherto attainable, the *Monstrosus* is distinctly an improvement. It seeds freely, but probably it will be necessary to propagate it by root-cuttings or side-shoots as usual.

Carnation Cyclops.—A few years ago a French nurseryman offered a strain of seed under the name of *Dianthus plumarius hybridus*, said to be a cross between *D. plumarius* and a Remontant Carnation. Plants from these proved to be very hardy, and were furnished with single flowers of an unattractive dull magenta. The strain offered as *C. Cyclops* seems to be a similar cross with a wider range of colors, some of which are pleasing, and it bids fair to be a useful plant for the garden. Double-flowering kinds were also offered, but these were not experimented with. The seeds of these germinated very strongly, in marked contrast with the Redondo Carnations offered by H. A. Dreer. These are said to have originated in California. The plants have very glaucous Carnation-like leaves, and there seems to be a great range of form and coloring among the flowers which are now showing. As they are very fragrant, come into flower the first season, and many of them are double and of good color, this strain seems to be worthy of further trial.

Elizabeth, N. J.

G.

The Forest.

Forestry in Prussia.

IN former numbers we have quoted extracts from a chapter on the "Woods of Minnesota," prepared by Mr. H. B. Ayres for the last volume of the Geological Survey of that state. Another portion of the same admirable paper includes some observations of Mr. Gifford Pinchot on Forestry in Prussia, which we reproduce below :

"All forest-management may be said to rest on two closely related facts which are so self-evident that they might almost be called axioms of forestry, but which, like other axioms, lead to conclusions of far-reaching application. These are, first, that trees require many years to reach merchantable size; and, secondly, that a forest-crop cannot be taken every year from the same land. From the last statement it follows that a definite far-seeing plan is necessary for the rational management of any forest, from the first; that forest-property is safest under the supervision of some imperishable guardian, or, in other words, of the state."

"Holding it as a duty to preserve the woodlands for the present share which they take in the economy of the nation, the state has recognized as well the obligation to hand down its forest-wealth unimpaired to future generations. It has recognized and respected equally the place which the forest holds in relation to agriculture and in the economy of nature, and hence feels itself doubly bound to protect its woodlands. In a word, it has been seen that in its direct and indirect influence the forest plays a most important part in the story of human progress, and that the advance of civilization only serves to make it more indispensable."

It has, therefore, steadily refused to deliver its forests to more or less speedy destruction by allowing them to pass into the hands of shorter-lived and less provident owners.

Even in the times of the greatest financial difficulty, when Prussia was overrun and nearly annihilated by the French, the idea of selling the state forests was never seriously entertained.

But the Government of Prussia has not stopped here. Protection standing alone is irrational and incomplete. The cases where a forest reaches its highest usefulness by simply existing are rare. The immense capital which the state woodlands represent is not permitted to lie idle, and the forest, as a timber producer, has taken its place among the permanent features of the land. The Government has done the only wise thing by managing its own forests through its own forest-officers.

"Donner, now Overland Förstmeister, in a work which carries all the weight of an official document, says:

"The fundamental rules for the management of state forests are these: First, to keep rigidly within the bounds of conservative treatment; and secondly, to attain, consistently with such treatment, the greatest output of most useful products in the shortest time."

"The state believes itself bound, in the administration of its forests, to keep in view the common good of the people, and that as well with respect to the lasting satisfaction of the demand for timber and other forest-produce, as to the numerous other purposes which the forest serves. It holds fast the duty to treat the Government woodlands as a trust held for the nation as a whole, to the end that it may enjoy for the present the highest satisfaction of its needs for forest-produce and the protection which the forest gives, and for all future time, at least an equal share of equal blessings."

"The forest is a trust handed down from former times, whose value lies not only in its immediate production of wood, but also essentially in the benefit to agriculture of its immediate influence on climate, weather-protections in various ways, the conservation of the soil, etc. The forest has significance not only for the present nor for its owner alone; it has significance as well for the future and for the whole of the people."

"With respect to the second class of forest-property, that belonging to towns, villages and other public bodies, it is again impossible to speak for the whole of Germany except upon the broadest lines. The state everywhere exercises oversight and a degree of control over the management of these forests, but the sphere of its action varies within very wide limits. Even within the individual states it does not remain the same. Thus far, however, the action of the Government is alike, not only throughout Prussia, but in all parts of Germany. It prevents absolutely the treatment of any forest of this class under improvident or wasteful methods; nor does it allow any measure to be carried into effect which

may deprive posterity of the enjoyment which it has a right to expect."

"The relations of the state to the third class of forests, those belonging to private proprietors, are of a much less intimate nature. The basis of these relations is, however, the same. To quote again from Donner: 'The duty of the state to sustain and further the well-being of its citizens, regarded as an imperishable whole, implies for the Government the right and the duty to subject the management of all forests to its inspection and control.' This intervention is to be carried, however, 'only so far as may be necessary to obviate the dangers which an unrestrained utilization of the forest by its owners threatens to excite, and the rights of property are to be respected to the utmost consistency with such a result.' Prussia, of all the German countries, has respected these rights most highly, and the Government exerts practically no restraining influence except where the evident results of deforestation would be seriously dangerous. Here it may, and does, guard most zealously the woodlands, whose presence is a necessary safeguard against certain of the more destructive phenomena of nature, and which have been called in general 'protection forests.' Of their many-sided influence so much has been said and written of late in America—both truly and falsely—that no further reference to the subject seems needful.

"The state leaves open a way of escape for the private proprietor who finds himself unwilling to suffer such restriction of his rights for the public good, and shows itself willing to buy up areas not only of protection forests but also of less vitally important woodlands. On the other hand, it is ready, with a broadness of view which the zeal of forest-authorities sometimes unfortunately excludes, to give up to private ownership lands which, by reason of their soil and situation, will contribute better to the commonwealth under cultivation than as forest.

"In this way the forests, whose preservation is most important, are gradually passing into the hands of the state; yet the total area of the woodlands is increasing but slowly.

"The policy of state aid in the afforestation of waste lands important through their situation on high ground or otherwise is fully recognized (a notable example exists upon the Hohe Venn, near Aix-la-Chapelle), but the absence of considerable mountain-chains has given to this branch of Government influence very much less prominence than in the Alps of Austria, Switzerland and France, where its advantages appear on a larger and more striking scale.

"In closing this brief sketch of forest-policy in Prussia, you will perhaps allow me to refer for a moment to the erroneous ideas of German forest-management which have crept into our literature. They have done so, I believe, partly through a desire of the advocates of forestry to prove too much, and they injure the cause of forestry, because they tend to make forest-management ridiculous in the eyes of our citizens. The idea has risen that German methods are exaggeratedly artificial and complicated, and not unnaturally the inference has been made that forestry in itself is a thing for older and more densely populated countries, and that forest-management is inapplicable and incapable of adaptation to the conditions under which we live. It is true, on the contrary, that the treatment of German forests is distinguished above all things by an elastic adaptability to circumstances, which is totally at variance with the iron-clad formality which a superficial observation may believe it sees. It is equally true that its methods could not be transported unchanged into our forests without entailing discouragement and failure, just as our method of lumbering would be disastrous there; but the principles which underlie not only German, but all national forest-management, are true all the world over. It was in accordance with them that the forests of British India were taken in hand, and are now being successfully managed, but the methods into which the same principles have developed are as widely dissimilar as the countries in which they are being applied."

So forest-management in America must be worked out along lines which the conditions of our life will prescribe. It never can be a technical imitation of that of any other country, and a knowledge of forestry abroad will be useful and necessary rather as matter for comparison than as a guide to be blindly obeyed. It must be suited not only to the peculiarities of our national character, but also to the climate, soil and timber of each locality, to the facilities for transportation and relations of supply and demand, and the hundred other factors which go to make up the natural character of a hill-side, a county or a state. Its details cannot be laid down *ex cathedra*, but must spring from a thorough acquaintance with the theory of forestry, combined with exhaustive knowledge of local conditions. It will necessarily lose the formality and minuteness

which it has acquired in countries of older and denser settlement, and will take on the character of largeness and efficiency which has placed the methods of American lumbermen, in their own sphere, far beyond all competitors.

Correspondence.

Hardy Plants in Flower at Short Hills, New Jersey.

To the Editor of GARDEN AND FOREST:

Sir,—I went over to the United States Nursery a few days since to see, more especially, what effect the long spell of dry and insufferably hot weather prevailing lately had had on the hardy plants. This is a rather severe test, since the plants are fully exposed on a hillside which is somewhat dry, but I failed to notice any injury visible. This is probably because the plants are well cultivated, with the soil kept loose, a condition of things not always possible in a small garden. Lilies at this season, perhaps, call for the first notice. There was a fine selection of *Lilium auratum* varieties, *L. auratum macranthum* (or *platypetalum*) being the gem of the collection. This variety is very distinct, having broader leaves than the type. In well-established plants the stems are an inch or more in diameter. The flowers are very large, twelve inches in diameter, with pure yellow bands and studded with yellow spots. *L. auratum pictum* has bands shading from red at the tips of the petals through yellow to green at the centre. *L. auratum vittatum rubrum* has a dull crimson band, in some cases very broad. *L. auratum Witte* is a pure white variety, with a clear yellow band. The typical *Auratum* Lilies are such popular plants that these rarer varieties are well worth noting. Some double-flowered Tiger Lilies made a broad mass of color and individually were striking flowers. *Delphinium Sinense* was in broad masses in three colors, white, dark blue and light blue, the latter being especially pretty and showy. This is a rather low-growing variety some eighteen inches high at present.

Pardanthus Chinensis is a rare plant with reddish orange flowers spotted brown. It is iridaceous, with sword-like, stem-clasping leaves, and seems to be a distinct plant worth growing, though probably not reliably hardy further north. Midsummer, of course, brings many yellow Composites to perfection. Besides the ever-present *Anthemis tinctoria* I noted that Messrs. Pitcher & Manda grow *Rudbeckia speciosa* (*Newmanii*) in quantities. This is certainly a showy Cone-flower, very effective in masses. Another plant labeled *R. subtomentosa* was an interesting variety, with long, narrow petals and greenish yellow cones.

Heliopsis lævis is a native Sunflower, grown here largely, but it does not strike me as producing a desirable effect except for a wild plantation. Hardy Sunflowers are deservedly popular plants. Probably the best selection that can be made is *H. decapetalus*, *H. decapetalus multiflorus*, *H. rigidus*, *H. lætiflorus*, *H. orgyalis* and *H. Maximilianii*. The two latter have very distinct and attractive foliage at all seasons, the narrow drooping leaves proving peculiarly effective. To the above varieties might be added *H. mollis* for a bold group, a plant of very stiff erect habit with broad foliage and *Inula*-like flowers.

The photographer was busy over a new Sunflower of an undetermined species, which was a very striking plant about three feet high, entirely covered with deep yellow single flowers about two to two and a half inches in diameter, and individually very neat and distinct. The foliage was small, and though not abundant seemed hard and good.

Few flowers can vie in color with *Lobelia cardinalis*. A mass of Cardinal-flowers seemed as happy in this dry soil as in its native bogs. The hardy Blanket-flowers (*Gaillardia grandiflora*) are effective plants when well-grown, though they seem to decline to take the compact form of the catalogues. There are few hardy plants which have a longer season of flowering or are altogether more satisfactory. *Achillea*, The Pearl, has deservedly excited much attention lately, as it is a great improvement on the old Milfoil, *Ptarmica*, one of the weediest and most straggling of hardy flowers, though useful for its small white blossoms.

Elymus glaucus should interest every lover of grasses. It is very glaucous, and a good clump would excite attention in any garden. Another somewhat effective foliage-plant grown here is *Eryngium amethystinum*, one of the brightest of the Sea Hollies. I was glad to see a lot of *Viola tricolor*, the old-fashioned Heartease, or Johnny-jump-ups, of our grandmothers' gardens. Mr. Manda thinks he has a treasure in a new double purple *Datura*, which is certainly a vigorous

grower and bears a wonderful flower, quite as big as the *Brugmansia*.

In the houses I found a new *Begonia* species (tuberous), with the habit of *Martiani*, but with handsome spotted leaves and pinkish stems. Many varieties of Orchids were in flower, the most striking of which was a pure white form of *Cattleya Gaskelliana*. The great collection of *Cypripediums* here always gives me a sense of confusion, it is so impossible to comprehend the wonderful variety in the time at one's disposal. When Mr. Manda casually picks up a small pot graced with three or four leaves and remarks that it is the other half of a plant which he has sold for \$675, one muses on his fifty-cent specimens of the same genus at home and concludes that only the *Cypripedium* fancier can do justice to the subject.

Elizabeth, N. J.

J. N. Gerard.

Home-made Linen.

To the Editor of GARDEN AND FOREST:

Sir,—It is almost with a feeling of veneration that I now spread my home-spun table-cloths to serve for dinner. They are the last of a trunkful of linen brought over the Atlantic thirty years ago. Throughout this long period they have been in constant use, but now, unless supplemented by newer fabrics, their end is at hand. For more than fifty years the hands that so willingly spun and wove these threads for others' use have been resting in the grave—hence the sacredness which attaches to these relics of a former generation.

In the German household the love of linen is a passion. During the French wars under Napoleon when, from every town and hamlet, the terror-stricken people fled before the approaching armies, before all else they sought to save their many chests of home-spun linen, and when peace returned, what had escaped the Argus-eyed enemy was tenfold more precious, because of the horrors witnessed and the dreadful pangs endured. And even to-day the German woman prizes, far above rubies, her piles of snowy linen, the labor of many happy hours.

Here in this country the use and sale of imported linens assume yearly larger dimensions. The people are learning to realize its value and comfort as an article of wearing apparel. The southern product, the cheaper cotton, supplies the world's demand. Why may not the north add to its resources by reviving this old and important industry, and raise, at least, sufficient flax for home consumption? The women, too, would gain by its revival. Instead of spending time and strength upon the almost worthless trash called bric-a-brac, which cumber rather than adorns their homes, they might again possess their stores of home-made linen, which far surpasses in value and durability the best product of the machine. We live only for a day. Why may we not go more slowly and evolve a truer prosperity with its resulting tranquillity?

In European countries, when at certain seasons the traveler turns his eyes over the landscape, he sees dotted here and there fields of blossoming blue which ripple in the summer sunshine like the waves of the sea. They are acres of blossoming flax, sowed and cared for with surprising interest by the members of the household to which it belongs.

During a lifetime of observation one sees many changes in the customs and sentiments of people and nations. As in Bible days, there is a time for everything. The coming World's Fair will offer a grand opportunity to show what feminine hands abroad are doing in the seclusion of the home, from the Hungarian peasant woman's world-famed embroideries of home-spun linen to the lace-like products of the hand and loom of working and gentle woman. The number and variety of fabrics produced from this little slender-stemmed plant, in itself so insignificant, are so enormous that it may be well worth while to consider its re-introduction into our own country.

Hartford, Conn.

Wilhelmina Seliger.

Albinos among Orchids.

To the Editor of GARDEN AND FOREST:

Sir,—In your issues of March 23d and June 22d the occurrence of a white form of *Habenaria psychodes* is noted. Last July I collected not *H. psychodes*, but *H. fimbriata*, on an open hill-side bog near Tannersville, New York, where it grew in quantities, and with it a white form as beautiful, if not more so, than its rose-purple neighbors. The flowers were identical as far as I could see, though possibly very slightly smaller. This year, on July 23d, in crossing the same bog, I found the *Habe-*

naria in full bloom, the white-flowered form, as last year, neither quite as large nor quite as abundant as the purple ones. It is a very handsome species, growing here from one to two feet tall among the Reeds and Grasses, the spikes often ten inches long and nearly three inches thick.

Ontora, N. Y.

Anna Murray Vail.

Local Plant Names in New Jersey.

To the Editor of GARDEN AND FOREST:

Sir,—As our boasted civilization progresses, and as railroads penetrate farther and farther into the wild and remote corners of our country, primitive conditions will be replaced by those more complicated, and differentiation and redifferentiation will follow closely this process of evolutionary growth. The forests will be destroyed for fuel and timber (to be renewed later at great expense), the streams of limpid water will be dammed for irrigation purposes, and the cleared and irrigated land will be cultivated. The customs of a simple and unsophisticated people will suffer by the same ruthless hand of progress.

I was very much impressed by this fact while traveling, some time since, through the sparsely settled portions of southern New Jersey. The farther I journeyed from the railroad and the deeper I penetrated into the lonely barrens and swamps, the more unsuspecting of strangers the people became, and the more hospitable. A man was harrowing a piece of sandy peat soil, near his one-storied cabin, with a triangular harrow, constructed of green limbs, into the framework of which, at irregular intervals, through auger-holes, were driven pointed sticks. An ox, attached to this primitive agricultural implement by means of a clothes-line spliced together and a bent stick as a yoke, was slowly breaking up the soil for a truck-patch; the poor beast was switching its tail in the vain endeavor to keep off the troublesome mosquitoes and the galling and persistent woodflies. This interesting picture of man, ox and harrow recalled the descriptions given of the early Aryan culture, when barley, wheat and flax were planted, and the ground was stirred by a crooked branch of a tree, tipped probably with the tine of a stag's antler, which served crudely as a plow.

Local names survive, as a general rule, in the process of speech evolution, and bear evidence of the cultural stage and inventive genius of a people in introducing new words for new phases of nature, and to describe new animals, plants and things. My purpose is to record in GARDEN AND FOREST a few of the local plant names current in parts of southern New Jersey. The fishermen along the Little Egg Harbor River call the Eel Grass (*Zostera marina*) Tiresome Weed, for, as they pull against the current in sailing to and from the ocean, the "grass wrack" entangles their oars and retards their movements. They also call the most beautiful of our spring Orchids, *Cypripedium acaule*, "Whip-poor-will Shoe," which is quite as poetical as *Lady's-slipper*.

The common Pitcher-plant, *Sarracenia purpurea* (*Side-saddle-flower*, *Huntsman's-cup* in *Gray's Manual*), is called locally in Cape May County "Dumb Watches." The beautiful purple flower grows from the centre of the rosette of pitched leaves below, and after a time the purple incurved petals fall, exposing the summit of the broad, expanded, petal-like stigma. The five green sepals remain, and resemble, in the imagination of the peninsular New Jerseymen, a watch-case, and the convex surface of the expanded stigma is likened by them to the face of a watch. This vegetable time-piece, with no hands to point the hours of the day, without the constant tick, tick, tick, is dumb. The whole plant is denominated, very significantly and ingeniously, "Dumb Watch," or simply "Watch."

A person interested in folk-lore might find an interesting field for investigation and research among the simple, hospitable and intelligent inhabitants of the shore and inland towns of the Pine-barren regions of southern New Jersey.

Philadelphia, Pa.

J. W. Harshberger.

Notes.

In vol. xvii. of the *Botanical Gazette* Mr. John M. Coulter recently published a sketch of the life and labors of the late Sereno Watson, with a portrait and a view of the interior of the herbarium of Harvard University.

The Rose, *Gustave Piganeau*, was sent out in 1889, but it takes some time for a new variety to be fully tested. This one is spoken of very highly by the English growers, and it has held a very prominent place at the exhibitions there this year. The flower is very large and yet it is good in form

and has a clear carmine-like color without any dingy suspicions of lilac or purple which mar so many Roses which are otherwise good.

The International Botanical Congress, to be held this autumn at Genoa, Italy, will open on the 4th of September and will close on the 11th, unless there seems good reason for prolonging it a little further.

Tomato-plants which have been growing over vigorously during the recent warm and moist weather may have failed to set much fruit. Where this is the case a sharp spade should be run down beside them to prune off the roots, and this will turn the vigor of the plant toward forming fruit.

The project of removing the Botanical Garden in Berlin to a new and more favorable locality has long been under discussion. Plans for carrying it into effect have now been decided upon, and Herr Perring, Royal Inspector of Gardens, has been commissioned to examine the other great botanical gardens of Europe in search of helpful information.

The manufacture of a new material called Bamboo-sheeting is said to be rapidly extending in the province of Wenchow, in China. The cane is split so as to form a sheet which is softened in boiling water and then pressed out flat. When dried, the sheets are ready for use and are employed for veneering as well as in making trays, fans, screens and open-work carved panels.

It takes many years, and often many generations, to develop a fruit or vegetable with the best edible qualities from its original wild state. It was the opinion of Dr. Gray that if modern civilization had begun in America our Ground Nut (*Apios tuberosa*) would have been the earliest developed esculent tuber, and would probably have held its place among the first, along with Potatoes and Sweet-potatoes.

An official reward for a new large-flowered Pelargonium, which is called Lisbeth Moncorps, and is the offspring of the varieties Mabel and Nympha, was recently bestowed in Germany upon Herr Moncorps. The plant is described as extremely sturdy and floriferous with flowers of a very pure color; and particular attention is called to the fact that, in ten months from the seed, Herr Moncorps had raised a specimen bearing about thirty strong flowering stems.

Late-blooming Tamarisks are just now very ornamental. Specimens that were cut back early in the spring are now waving their long and slender branches covered with fern-like foliage and pointed with great clusters of pink flowers. This is one of the shrubs which do very well where the sea winds prevail and even where the salt spray of the sea can reach them. But they do equally well farther inland, and are among the most beautiful trees which flower in late summer and early autumn.

We observe in some florists' windows a repetition of the practice which prevailed three or four years ago, of using the large white flower-heads of *Hydrangea paniculata grandiflora* on long stems, in large vases, with a few spikes of *Gladiolus* of some pronounced color. This makes an effective combination, as well as a very durable one, for the *Gladiolus* will continue to open its flowers in succession for a long time, and the *Hydrangea*-flowers will not only remain without wilting for a fortnight in a warm room, but will dry on the stem and preserve their creamy color throughout the winter.

Osbeck's variety of *Rhus semialata* is now ornamented with its large panicles of flowers, which are not a pure white, but which are nevertheless quite showy at this season, since they stand out well from the very dark green and clean foliage of the tree. None of the trees we have seen are more than twenty-five or thirty feet high, although, perhaps, they will attain considerably larger proportions in this climate. It is not as graceful as our native species, since the branches are not furnished with leaves except at the extremities, so that the tree has a rather bare and open look about the main branches.

In a pamphlet called *Chicago and the Columbian International Exhibition*, recently published in Berlin by the Imperial Commissioners for the Fair, German horticulturists are given all needful information and are heartily encouraged to make the best possible exhibition. We are glad also to find that *Gartenflora* calls attention to the fact, which we have already noted, that at a special meeting of the American Seedsmen's Association a cordial invitation was extended to European seedsmen, thus disposing of the unfortunate rumor that our

dealers had threatened to boycott such foreigners as might venture to compete with them at Chicago.

Phoenix Park, in Dublin, is more than six miles in circuit. It contains something like 1,700 acres, and consists of wooded slopes and deep valleys, with lakes in the hollows, and broad expanses of Furze-covered land and an abundance of majestic old Oaks, Elms and Beeches. Fifteen hundred sheep and a thousand fallow deer, said to be the finest in Her Majesty's dominions, are grazed in the park. The People's Garden is the name given to an area of about sixteen acres in the park devoted to the cultivation of various kinds of flowers. This flower-garden is very convenient of access, being within four hundred yards of Sackville Street, the principal street in Dublin.

Mr. Andrew D. Hopkins, of the West Virginia Experiment Station, writes to *Science* that one of the bark beetles (*Dendroctonus frontalis*) is destroying many coniferous trees in that section. It has generally been held that these insects do not attack living and healthful trees; but investigation shows that vigorous individuals of five species of Pine and of the Black Spruce have been killed primarily by the attacks of this beetle, which preys upon the green bark. Trees from five inches in diameter up to the largest specimens of White Pine have been ruined by them. When attacked in the autumn the trees may remain green until spring, when other bark and timber beetles re-enforce the original invaders to the number of twenty-five species. Later on these scolytids are followed by insects belonging to other families, until, in a dead or dying tree, there may be hundreds of species and millions of examples breeding in and feeding on every part of the tree, from the base to the terminal twigs, rendering it worthless for lumber within a year after it dies.

It is a pleasure to call the attention of instructors in botany to Professor Byron D. Halsted's brief article, "Beginnings in Botany," published in the August number of the *Popular Science Monthly*. "Much has been said," writes Professor Halsted, "largely in a theoretical way, concerning the general question of university extension. Various experiments have been made, and by another year definite plans will be matured for the popular presentation of many of the subjects that come within the scope of the extension movement as now understood by those who have had the most to do with the scheme for the education of the masses. The writer has recently finished a brief course in botany, and as the method pursued differed in some features from any previously followed, there may be sufficient reason for presenting an outline of the ground covered and of the ways and means employed for bringing the subject to the attention of a popular audience." Of course, it is impossible here to condense Professor Halsted's account of his work, but we feel sure that it will give helpful hints to all other persons similarly engaged.

The Michigan Flora, prepared for the thirtieth annual report of the Secretary of the State Board of Agriculture by Professors W. J. Beal and C. F. Wheeler, is much more than a simple catalogue of the plants of the state of Michigan arranged in the order of their botanical sequence. The pamphlet opens with a brief account of the topography of the state, dividing it into ten regions, whose physical characteristics are described, and whose outlines are laid down on a map. Rather full lists of the plants which are characteristic of each of these regions are then given. Notes on climate and distribution are added, and then come some interesting chapters on the trees and shrubs of Michigan as compared with those of the rest of the world, with the reasons why the Michigan flora is so rich and why there are so few species in Great Britain, for example. Interesting lists of trees, selected for various qualities, are furnished, as, for example, the native trees and shrubs which should be selected for the color of their leaves in autumn; small trees which are distinguished for their flowers; shrubs and trees which are distinguished for beautiful fruit, and those which are distinguished for showy or brilliant colored bark. Then come lists of plants which twine or climb in different ways; evergreens that turn to a bronze color in winter; plants suitable for winter bouquets; bog and marsh plants which are promising for cultivation, and native Ferns which deserve to be cultivated; trees which indicate a fertile soil, and others which indicate a barren soil; trees valuable for timber and for firewood; trees most durable as posts and sills, and most suitable for cabinet-work—all these and many more subjects are treated in an instructive and entertaining way in this pamphlet, which will be found interesting to very many persons outside of the state of Michigan.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLE :—A National Forest-policy.....	397
The Temperate House at Kew. (With figure.).....	W. 398
Overland in the Cayuga Country.—I.....	Professor L. H. Bailey 398
In the Woods of Eastern Texas.....	E. N. P. 399
Climbing Plants in the Pines.....	Mrs. Mary Treat 400
NEW OR LITTLE-KNOWN PLANTS :—New Orchids.....	R. A. Rolfe 400
FOREIGN CORRESPONDENCE :—London Letter.....	W. Watson 400
CULTURAL DEPARTMENT :—Notes on Shrubs.....	J. G. Jack 402
The Wild Garden in August.—I.....	M. Barker 403
The Water-garden.....	Wm. Tricker 404
Francoa ramosa, Melianthus major.....	E. O. Orpet 404
Tradescantia Warscewicziana, Costus igneus.....	R. Cameron 404
CORRESPONDENCE :—Some Questions About Taste.....	Mrs. J. H. Robbins 405
Plant-labels.....	C. B. W. 405
MEETINGS OF SOCIETIES :—The Florists at Washington: The President's Address.....	406
Fungous and Other Rose Troubles.....	Professor Byron D. Halsted 406
Floriculture for Children.....	Robert Farquhar 407
NOTES.....	408
ILLUSTRATION :—Central Walk in the Temperate House at Kew, Fig. 67.....	401

A National Forest-policy.

IN the closing days of the last session of Congress, Senator Paddock's bill "to provide for the establishment, protection and administration of public forest-reservations and for other purposes" was reported favorably to the Senate, and although it was impossible at that late hour to secure any action upon it, the bill was placed on the calendar ready to be called up at the beginning of the next session. In the executive machinery authorized by this act there may be some details about which opinions will differ, but this could be said of any act devised for this purpose, for it is hardly possible that a complete and entirely satisfactory forest-policy could be inaugurated at once. A perfect policy can only be developed after years of careful experience; but, inasmuch as we have no policy whatever, what is now needed is a measure which will secure some comprehensive preliminary work with the broad outlines of a general system, and these requirements are fairly met by the present bill.

We have said that the country has no forest-policy, and we are reminded by the very interesting report which has been printed with the bill that the Government does not know with any accuracy how much forest-land still remains in the public domain, and it knows even less about the quality and quantity of the timber which is now standing on that land. The most accurate statement which can be made now is that the United States Government holds an area of something less than seventy million acres designated as woodland, and mostly situated on the slopes and crests of western mountain-ranges, and no more definite knowledge can be had without long and laborious investigation. This property of unknown extent and value is left without any proper administration, to be ravaged every year by fires and by illegal and wasteful cutting. Some special measures for managing these forests have been enacted, it is true, but they have proved rather detrimental than other-

wise, and it is confessed in a public document that the impossibility of securing, in a straightforward and honest way from the Government, either timber or timber-bearing lands, has compelled the citizens of nine states and territories to become criminals if they take the timber which is necessary to enable them to exist. It has been asserted that more timber has been burned in a single year than has been legitimately used since the settlement of the country, but even if this is an exaggeration it is true beyond question that we are squandering our inheritance at a ruinous rate, and that unless this reckless destruction is arrested we shall, in a short time, not only be without a sufficient amount of timber for the economical uses of the country, but we shall suffer a long series of ever-increasing disasters which, as experience has demonstrated over and over again, will certainly follow if the forest-cover is removed from the sources of our great rivers.

Now, whatever is true as to the influence of the forest-area upon climate and meteorological phenomena, it is agreed by all authorities that a forest-cover exerts a salutary influence upon the water drainage and soil conditions. The French Government has already spent \$35,000,000, and expects to spend still more than this amount in the future, to repair the damages done by deforesting the mountains of that country, and it certainly is the part of wisdom to be warned by such an example. Fortunately, a forest need not become unproductive because it is held permanently to preserve the conditions of soil and water, which make agriculture and even existence possible over large areas. Under proper management our present forest-resources can be maintained and even grow in productivity every year, but this is not possible so long as the forest is under private ownership. The fact that a crop of timber requires, at least, half a century for its development shows the necessity of stable ownership and a conservative system of management. A forest-policy worthy of the name must be organized and administered in the interest of coming generations, and the state, which never dies, can alone be trusted with interests in the distant future. Beyond all dispute, then, the forests on non-agricultural lands of the national domain should be held as the property of the whole people forever.

The new law provides, in the first place, for a survey, to determine the extent and location of all forest-lands, after which the President is to withdraw from sale and entry all such lands except those that are found to be more valuable for agriculture than for forest-reservation. These non-agricultural timber-lands are to be transferred from the Department of the Interior, where lands are held only for disposal, to the Department of Agriculture, which is designed to look after cultural matters, and where a bureau in charge of forestry-matters exists. To save expense at the beginning, and to create as quickly as possible an efficient protective service, the army may be employed for this duty, as it has already been used in the Yellowstone and California parks. There is no occasion here to explain the provisions for cutting timber under license, or for the creation of a force of officers to attend to the business of forest-administration proper. It is only necessary to add that the system proposes a separate and complete administration, to be carried on by competent men under expert advice, and the principle is steadily kept in view that while the service of protecting water-sheds is of sufficient national importance to warrant expenditure out of other funds, nevertheless this service should be made to pay for itself by the sale of surplus forest-material.

In short, the immediate effect of the bill will be to ascertain just how much timber-land the Government has and where it is situated, the withdrawal from sale by the General Government of all such land and its protection by the army until a complete and effective forest-service can be organized. It is to be hoped that the meetings of the various scientific associations during this summer and autumn, as well as the conventions representing the various branches of horticultural and agricultural effort, will bring

to bear their collective influence upon members of Congress and urge the passage of this bill. A bill which has advanced no further than a favorable report in one house of Congress has many risks to run before it can become an operative act. This is the first time, however, after years of petition and entreaty, that a bill so good as this has ever been placed on the calendar, and if every man and woman in the country who has this cause at heart would make a personal effort to convince his or her representative in Congress of the desirableness of the legislation proposed, there is little doubt but that the law could be enacted during the next session of Congress.

The Temperate House at Kew.

THE temperate house, or winter garden, at Kew is one of the largest and handsomest plant structures in Europe. It was built thirty years ago from designs by Decimus Barton, the architect of the Kew Palm-house. Only a portion of the original design has been carried out, but it is still hoped that the whole will be completed. When this is done the whole building will consist of a centre connected with two wings by two small octagons. The centre and octagons, which were erected thirty years ago, are devoted to the cultivation of Australian, south African, Mexican, south European and Asiatic plants which thrive in a temperature from which frost is excluded. The centre is 212 feet long by 137 feet in width, and it is sixty feet high. Except the plants on the shelves against the walls of the house, the whole of the collection is grown in long parallel beds three to four feet deep. The main features in the house are the Tree Ferns, Palms, Acacias, Sikkim Rhododendrons, Camellias, Araucarias, Dammaras, etc. Such plants as *Araucaria excelsa*, *A. Bidwillii*, *A. Brasiliensis*, *Dammara robusta*, *D. australis* and *D. Moorei*, *Cyathea medullaris*, *Seaforthia elegans*, *Chamærops Fortunei*, *C. humilis*, *C. Martiana*, *Camphora*, *Podocarpus elongata* and *P. Totara* are represented by exceptionally large specimens, some of which almost touch the roof. The central walk, of which a view is shown on page 401, is bordered with Tree Ferns, Bamboos, Palms, *Musa Basjoo* and similar plants of striking appearance. The charm of this house is in its comfortable temperature at all times of the year, the natural arrangement of the plants and their generally robust health. A catalogue of all the species grown in this one house would surprise many people by its length and comprehensiveness. A gallery surrounds the house inside, and from this may be obtained a good view of the grand Tree Ferns, Palms, etc., which can scarcely be seen from the ground.

London.

W.

Overland in the Cayuga Country.—I.

IT was a bright morning in July when I drove down the great University Hill, at Ithaca, for a trip over the plateau which lies between Lakes Cayuga and Seneca. Rain had fallen a day or two before, and all the hill-sides stood out in the glory of a bountiful harvest. The great West Hill, which rises 800 feet above the valley beyond Cornell University, presented a maze of patch-work blocks and colors. Far up toward its crest the continuous green marked the region of hay; farther down, the irregular blocks and colors indicated wheat and barley and oats, each spreading a different hue under the steaming morning sun, and still farther down were blocks of orchards, in which the rows of Apple and Pear trees looked like the Currant-bushes in my garden, while the lines of Grapes were only distinct enough to add a seamed appearance to the hill-side. This alternation of the farm-crops is not accidental to the great West Hill at Ithaca, for one sees it, or something like it, in all countries where small lakes and rivers lie among the hills. The fruits love the protection of the water, and the orchards and vineyards and berry-gardens may be seen everywhere among these inimitable New York lakes lying far down the slopes next the water's edge. Nor is this the only advantage which the fruits obtain by this proximity to the water; they are nearer the means of transportation, and their owners are thereby brought into more frequent and intimate contact with their fel-

lows. It is undeniable that the fruit-grower is usually a better "posted" man than the general farmer. His environment educates him. He must deal with his products quickly and systematically; he must know the markets, and he must contend with almost innumerable pests. The visits of the commission-house agents keep him in touch with the outside world, and the daily or weekly returns from his salesmen drill him in correspondence and business. The grain-farmer hauls his wheat to the elevator and receives his pay in cash, but the fruit-grower depends upon the mails for his returns, and in proportion as the farmer patronizes the post-office does his education grow. So the fruit-grower receives a telegram from his salesman, and takes it as a matter of course, but a telegram going to an ordinary farm-house is usually a signal for anxiety.

This hill rose in front of us, while to the north stretched the blue waters of the beautiful Cayuga. If the reader will consult an atlas of New York he will be reminded that several lakes lie nearly parallel with each other in the central western portion of the state. Of these lakes Cayuga is the largest, stretching out forty miles in length and in one place reaching a width of five miles. But, horticulturally, it is not the most important, for Seneca and Keuka strive for the honor of sheltering the most Grapes, Plums, Peaches, Apricots and Quinces. At the southern extremities of these three lakes the hills are high and steep; and the creeks have worn deep gulches in the soft slate. Some of these gorges are veritable cañons, like the Ithaca gorge at the head of Cayuga, whose walls rise bold and sheer to a height of over 200 feet, and often they are marvels of intricacy and beauty, like the world-famed Watkin's Glen at the head of Seneca. Toward the north the shores slope softly away into low and fertile plateaus. It is this table-land between Cayuga and Seneca lakes that we are to cross. We leave Ithaca at the head of Cayuga, and if we have no mishap shall reach Geneva, at the foot of Seneca. In the mean time we shall have passed over a country famous in the early days for its fertility, and shall reach the borders of one of the most remarkable horticultural regions upon the American continent.

For five or six miles we rise upon West Hill nearly parallel with the lake, and the deep blue waters, with the great university beyond, lie farther and farther below us, like a huge mirror reflecting the sky and hills. Meantime, we have passed through most of the horticultural region, which, at best, is small in the neighborhood of Ithaca, and it is mostly of a local interest. Yet there is no good reason, barring the indifference of the inhabitants, why this hill-side should not become as fruitful as similar slopes upon Seneca and Keuka lakes; and some day this must come to pass. Here are some old orchards, however, especially some dwarf Pear-orchards, which were planted under the inspiration of the Downings, and which, after the lapse of twenty and thirty years, are still thrifty and productive. But there is now abundant evidence that dwarf Pears are comparatively long-lived, although the notion to the contrary is everywhere present. The famous Yeomans Orchard, in Wayne County, is now nearly forty years old, and still in the full tide of its vigor. But dwarf Pears need better attention than most people give, and, therefore, few succeed well with them. I am convinced that one of the most important elements in the successful cultivation of them is to head them in annually at least half or two-thirds of the new growth. This process keeps the top low and greatly lessens the tendency to break from the Quince stock. About Ithaca this low heading is seen, trees which are thirty years old standing not over eight or ten feet high.

But the most significant features of the country we are now traveling are the signs of approaching age. Here is a Peach-orchard standing stark against the sky, every limb having died years ago from sheer old age; and there is a dwarf Pear-orchard, which was once the pride of the neighborhood, grown into a seared and mossy tangle, with here and there a Quince-bush to mark the spot where some pear has fallen. And this Pear-orchard is doubly sad, because we have but recently passed one as old which is in good health. The old Apple-orchards are a marvel. They are the relics of the early days, fifty and even seventy-five years ago, when the virile young farmers built the long walls and the wide-gabled houses. Now they are tall and gaunt, and their fruitage having failed through years of neglect, the owners have trimmed them up with axe and saw until their scarred and crooked trunks often rise ten or twelve feet high. They have long since outgrown their usefulness, and the best spray can scarcely penetrate their thick and lofty tops. Wise economy would have planted other trees long ago, and these would have been consigned to the kitchen-stove when old age first showed itself. But young orchards

are seldom seen, and the growers complain that apples no longer pay! Why is it that farmers can understand a Wheat-field, or a Potato-patch, but cannot learn the first lesson in tree-culture? Why is it that year after year they drag through the twelve months with no respite of shade or fruit and pass down to their successors only a bare and burdened farm?

Some of these old orchards bear profusely in occasional years, but the fruit is poor, being largely natural or seedling varieties, and the labor of picking from the tall and scattered trees is greater than the fruit is worth. I have a mind to stop at every farm-house and urge the people to cut down the old orchards; but no! that would be cruel. Better leave something to warm the hearts of the growing boys and girls and to give them some fragrant memories of the old farm, for I take it that most of them will leave it in due time.

But I am not saying that this is a poor or infertile country. I have only tried to say that there is little evidence of new purpose, for when the old trees pass away the orchards will be gone. We shall not travel far over these hills until we find evidences of the new life which freshens the soil and adds a new interest to the old farms. These farms which we are now passing, let it be said, grow as big crops of wheat and hay as they did in the early days, but the products must be wrung from the soil by greater effort. It is not true that the soil is exhausted in these lands which fifty years ago were the Wheat-fields of the west. Wheat-lands have given way to stock and the dairy in many cases, and yet Wheat is the staple, and finer crops of it never grew on the prairies of Illinois or Dakota than we are now passing along the road from Jacksonville to Trumansburg. We now lose sight of the lake except at intervals, and we find ourselves well up on the tops of the hills, ten miles from Ithaca. It is a beautiful country. The soft hills roll onward to the sky-line, ribbed by ravines and veined here and there by rectangular wood-lots, and everywhere strapped together by the winding roads. Broad quiet valleys run off here and there. The road-sides are freshly mown, for it is now haying-time, and their flowing outlines add the finish to pleasant country scenes.

The little hamlets along the way all bear the flavor of earlier days. The taverns at the four corners with porch touching the street, and the old open sheds and weather-beaten barns at the side, are reminders of the stage-days; and the village fathers still loaf about them with stories of their youth. Jacksonville is one of these hamlets, and it is particularly interesting to us, because the so-called original tree of the King of Tompkins County apple stands here. This is in Tompkins County, whence the apple got its name, and every gray-haired man will tell the story of the old tree. Nevertheless, none of them know its true history, and I, too, for obvious reasons, will not tell it. But the tree is grafted, and the grafts appear to have been brought from the lower Hudson River region early in the century. There the apple was known as the Flat Spitzenburgh, and its origin appears to be lost. Several persons brought grafts from this region to Tompkins County, but this tree at Jacksonville is the oldest one left, and it is the one from which most of the stock has been distributed. It is two feet in diameter and is still vigorous.

Cornell University.

L. H. Bailey.

In the Woods of Eastern Texas.

THIS part of Tyler County is a hundred miles from the Gulf of Mexico, and nearly as far from the west line of Louisiana—that is, it is about on the thirty-first parallel, and in longitude about $34^{\circ} 30'$. Geologically, this is in the older part of the newer Texas. With the exception of the large rivers that rise in the highlands northward and westward, the county is watered by numerous small spring-fed brooks, and sometimes small bogs occur. The soil is generally sandy and light, almost sterile in places. When mixed with alluvial deposits it becomes black and highly productive. It is well adapted to the cultivation of Pears, Peaches, Strawberries and garden-vegetables. Doubtless, in eastern Texas, as elsewhere, soils occupied by coniferous forests will become better after clearing by age and cultivation. Along the sandy banks of the little brooks the handsome little *Mayaca* is common. In some localities we see the tall yellow trumpets of *Sarracenia flava*, and in the small sphagnum-carpeted bogs *Utricularia cornuta* abounds with *Calopogon pulchellus*, *Pinguicula pumila*, a *Xyris*, and the queer, glistening red leaves of some Sundew not yet in blossom.

In the Pine-woods the pretty *Polygala polygama* is very common, and more rarely its more southern cousin, *P. lutea*.

Aristolochia reticulata is often seen, and very rarely in Texas, as my experience goes, is the northern *A. serpentaria* found among its neighbors. These species both have aromatic roots, and doubtless the same medicinal properties.

Of shrubs, *Stillingia ligustrina* and one species of *Myrica*, if not two, are everywhere. So *Itea* now displays its racemes of rather handsome but scentless white flowers. The Silver Bell (*Halesia*) and *Chionanthus* blossom much earlier. By the way, Snow-flower, as its generic name signifies, would be a more euphonious as well as a more significant common name than Old Man's Beard, or Fringe-tree, for the well-known last-named species.

But I set out to write of the Silva of eastern Texas. The sandy land is principally occupied by *Pinus mitis* and *P. tæda*. Pine-forests are pleasant, but weird places withal to visit. Their tall columnar trunks, needle-like leaves, the peculiar souging of the winds in their tops, such as is heard in no other forests, and their dislike for other forms of vegetable life, fill the visitor with an awe amounting almost to reverence. But one is glad to visit these primeval Pine-woods, because their existence in some forms runs back in time far beyond that of most of their deciduous neighbors, and yet one is saddened by the thought that the whole class of conifers are being destroyed by a short-sighted extravagance which, in a few years, will render a large Pine-tree as much of a rarity and curiosity as a *Sequoia* is now. Pine-trees here are not large, rarely becoming two feet in diameter, but they are tall, straight and handsome.

Here along the creek-bottoms are tracts of Beech-trees that would do credit to a New York forest. Beech is not only a stately tree, it is also a staid one. Though common in our original forests from New Brunswick to Wisconsin, and southward to central Florida, and in Texas to within reach of the salty breezes of the Gulf, yet the tree is everywhere itself.

We can count at least a half-dozen species of Oak, *Quercus aquatica* being the most abundant species; that species is set down in the books as a small tree. Near Nacogdoches, Texas, I measured one that was over twelve feet in circumference. At Arkadelphia, Arkansas, I met with individuals still larger and proportionally tall.

With the northern Hickories, Sugar Maple, Red Maple (small form), White Maple, White Ash, American and Slippery Elms, *Ostrya*, *Carpinus*, River Birch, Basswood, *Alnus serrulata*, Flowering Dogwood, Black Cherry, Witch-hazel, Box-elder, and the vicious *Rhus vernix*, which has not left its poisonous effluvium north, as a wrapped and swollen hand bears painful witness, growing everywhere around him, with sphagnum bogs and the Partridge-berry common in the Pine-woods, one would almost fancy that he was in a northern forest. But the strong, sweet odor of the Evergreen *Magnolia* mingled with its less pretentious but hardly less handsome and odorous deciduous congener, *M. glauca*, and the presence of Sweet Bay (*Persia*), Wild Peach (*Prunus*), of *Ulmus alata*, *Planera*, *Chinquapin*, Holly and Cassine recalls his wandering, and leaves him in the woods of eastern Texas. The Evergreen *Magnolia*, as it is usually seen in its native woods, is a very plain tree, with coarse, scattered branches, and bark becoming rough and scaling with age. In thinner woods and open fields it thickens up and becomes, at its best, the handsomest and most conspicuous forest-tree of its range. It sometimes attains a diameter of over four feet, and reaches a hundred feet in height. The species crosses the ninety-sixth meridian in Waller County, which is about its western limit. The most northern locality where I have seen the species growing in cultivation is Fayetteville, Arkansas, near the thirty-sixth parallel. *Magnolias* have lived there in apparent health for many years, though the mercury sometimes sinks to eight or ten degrees below zero. Holly grows in the gardens of Fayetteville with *Magnolia*, but not so vigorously.

Some botanical writers in describing *Ilex vomitoria* limit its range to a distance of twenty miles from the Gulf-coast. Nature is kinder and more liberal to the species, and allows it to grow in great abundance at least a hundred miles from the Gulf. So far as I can learn, no one is using an infusion of the leaves of Cassine as a substitute for tea. Some people did use them in that way during the privations of war, as they may have used seeds of *Sesbania Cavanillesii* as a substitute for coffee, and Mesquit-beans instead of wheat and corn for bread. But it is hardly fair to accuse southern people of committing such foolishness now.

Two weeks later than the date of the above notes, I saw in the San Jacinto valley, west of Conroe, nearly the same forest-growth. Sugar Maple, Beech, Witch-hazel and *Rhus vernix* had, however, been left behind.

Bastrop, Texas.

E. N. P.

Climbing Plants in the Pines.

WE have two distinct forms of *Ampelopsis* in the Pines. One has larger leaves than the other, of a lighter green, and the venation is much more marked in the larger form, while the flowers, which appear early in June, are about the color of Grape-blossoms. The smaller-leaved one begins to flower about the middle of July and continues in bloom until August. The buds and flowers are a dark purple color. It blossoms much more profusely than the other, is quite handsome, and attracts a great many insects, especially honey-bees. The leaves are very smooth, of a leathery texture, and dark bluish green in color. I found it in the Pines and transplanted it in my garden some five or six years ago, where it now covers a low-headed Apple-tree. I recently sent fresh specimens of both forms to Professor Sargent, who says of the late-flowering *Ampelopsis* "that it is certainly a curious-looking vine and ought to be transplanted to the Arboretum to see how it will behave there."

What a pity that *Rhus Toxicodendron* is poisonous. It is often confounded with *Ampelopsis* by those not versed in the scientific knowledge of plants. Others more observing, but not learned in botany, call both vines Ivy. *Ampelopsis* is the Five-leaved Ivy and not poisonous, while the other is called Three-leaved Ivy (Mercury), and known to be poisonous to many people. But how handsome it is in the Pines, clothing old decaying trees with thick overlapping foliage.

The wild Grape-vines, too, are handsome. One large vine often forms a sort of arbor by clambering over the tops of two or three small trees. Nothing can be more charming than these bowers often are; sometimes, however, the rampant vigor of the vine overburdens and oppresses the trees which support it in a way that excites our pity.

Very fragrant, too, with a spicy distinctness quite their own, are the blossoms of these wild Grapes. It has a genuine North American odor, and belongs as truly to this western world as does the breath of Indian Corn-tassels in an August evening. Compared with it the odor of garden Grape-flowers is tame and spiritless.

The Virgin's Bower (*Clematis Virginiana*), the most graceful of our wild vines, is now covering wayside shrubs with its snowy bloom, and its downy gray seed-clusters will be still more beautiful until late in autumn.

I occasionally see the Trumpet Creeper (*Tecoma radicans*) in damp places in the Pines and along country road-sides; but whether the winged seeds have been wafted from cultivated plants, or whether it is truly indigenous here as it is in Pennsylvania and in the southern states, I cannot tell. I only know that I never saw it in the early days of our settlement. But when planted it grows most luxuriantly and has to be kept in check, or it would soon swamp everything in its neighborhood.

The Bittersweet (*Celastrus scandens*) clammers about here and there in damp places, becoming very decorative in autumn, when its orange-colored pods open and show the bright scarlet seeds. The Trumpet Honeysuckle (*Lonicera sempervirens*) we also find, and it is almost evergreen with us. It is a handsome vine both in flower and fruit, and is quite extensively cultivated; but for the past few years it has been so badly infested with aphides that almost everybody has discarded it here. Strangely enough, I have never found the wild plants molested by these insects.

The Smilax must not be forgotten. Indeed, one who has attempted to penetrate our damp thickets will not be likely to forget it. *S. rotundifolia* and *S. tamnoides* are the most to be dreaded. The tangled masses, armed with stout prickles, climbing triumphantly over shrubs and trees, completely bar the way to many choice plants. And yet how handsome one of these plants can be made, especially *S. tamnoides*, with its bright shining evergreen leaves and clusters of black berries that remain all winter. And *S. Walteri* is also found here. This, too, has evergreen leaves, coral-red berries, and few or no prickles. It is a charming vine, and should be in cultivation.

Our Wild Yam is a graceful vine, neat and pretty, much more delicate than the Chinese Yam, which is sent out under the name of Cinnamon Vine. The Canadian Moonseed (*Menispermum Canadense*) is another delicate twiner, with pretty foliage and curious large stony seeds in the form of a crescent. *Apios tuberosa* is everywhere in the damp Pines, trailing over shrubs and bushes. In August and September it has thick, compact, dense racemes of brownish purple pea-shaped blossoms which are quite fragrant. But it spreads rapidly by underground stems, which are strung with roundish tubers, each tuber sending up twining stems.

We have one twiner in the Composite family—*Mikania*

scandens—which we find in damp places, climbing over bushes. It has heart-shaped leaves and panicles of pinkish colored flowers. It begins to bloom in July, and I have often found good clusters of flowers as late as October.

Some three or four species of the curious twining leafless Dodder are in the Pines. These plants start in life like all well-behaved vines, taking their nourishment, as in duty bound, from mother earth, but they soon become demoralized, yielding to temptation and let go their hold of earth and closely twine around their nearest neighbors, upon whom, like true parasites as they are, they henceforth wholly depend for nourishment and support.

Vineland, N. J.

Mary Treat.

New or Little-known Plants.

New Orchids.

CATTLEYA VICTORIA REGINA, O'Brien.—A handsome *Cattleya*, allied to *C. Leopoldii*, with large rosy purple flowers. The lip is three-lobed. It was imported by Messrs. F. Sander & Co., of St. Albans, and was awarded a first-class certificate by the Royal Horticultural Society on May 3d last. It is described in the *Gardeners' Chronicle* for May 7th, p. 568, and figured in the same work on June 25th, pp. 808, 809, figs. 115, 116.

ODONTOGLOSSUM ANDERSONIANUM PULCHERRIMUM, O'Brien.—A brightly colored form of the very variable series of natural hybrids between *O. crispum* and *O. gloriosum*, which are variously known in gardens under the names of *O. Andersonianum*, *O. Ruckerianum* and *O. hebraicum*. It may be briefly described as a darkly colored *O. Ruckerianum*. It flowered in the collection of R. B. White, Esq., of Arddarroch, Scotland.—*Gardeners' Chronicle*, May 7th, p. 586.

ODONTOGLOSSUM PLATYCHEILUM, Weathers.—A distinct and elegant species, with large, rather flat, white flowers, the lip being beautifully spotted with rosy purple. It flowered in the collection of R. I. Measures, Esq., of Camberwell, and received an award of merit from the Royal Horticultural Society on March 22d last. Strange to say, nothing is known of its origin, the only plant known having been acquired at the sale of the Downside collection.—*Gardeners' Chronicle*, May 7th, p. 587, fig. 84.

LÆLIO-CATTLEYA × *PHŒBE*, Hort.—A handsome hybrid raised from *Cattleya Mossiæ* crossed with the pollen of *Lælia cinnabarina*. The flowers are of a rich Indian yellow, with the middle lobe of the lip deep purplish crimson. It was exhibited by Norman C. Cookson, Esq., of Wylam-on-Tyne, at a meeting of the Royal Horticultural Society on May 3d last, and was awarded a first-class certificate.—*Gardeners' Chronicle*, May 7th, p. 598, also June 18th, p. 781, fig. 114.

LÆLIA × *LATONA*, Hort.—A handsome hybrid raised from *Lælia cinnabarina* crossed with the pollen of *L. purpurata*. It is like a small form of the latter, with deep yellow sepals and petals, and a dark crimson lip. It was exhibited at a meeting of the Royal Horticultural Society on May 3d last, and received a first-class certificate.—*Gardeners' Chronicle*, May 7th, p. 598, also June 18th, p. 791, fig. 114.

Kew.

R. A. Rolfe.

Foreign Correspondence.

London Letter.

ARISTOLOCHIA GIGAS, var. *STURTEVANTII*, is the great attraction at Kew this summer. It is grown in the Nymphæahouse, trained along the rafters so that the flowers hang over the water. What extraordinary flowers they are! There were five open one day this week, all very large and richly colored. Visitors are puzzled by them and are sometimes doubtful of their genuineness, as they are sometimes of the Cacti, which are supposed by some to be made of wood and cunningly painted. An artist friend said the *Aristolochia*-flower was a lady's calico sun-bonnet. We are very grateful to Mr. E. D. Sturtevant for this



Fig. 67.—Central Walk in the Temperate House at Kew.—See page 398.

plant, which is vastly superior to the type as named and figured by Lindley. Moreover, it is as easily cultivated as an *Allamanda*, and the disagreeable odor of its flowers is easily counteracted by having in the same house with it

such powerfully fragrant flowers as *Hedychiums*, *Stephanotes* or *Gardenias*. This plant has already been widely distributed from Kew. It is certainly one of the most interesting of all cultivated tropical plants. I might mention

that it is easily propagated from cuttings of the half-ripened shoots. Other large-flowered Aristolochias in flower now are *A. ornithocephalus*, *A. hians*, *A. tricaudatus*, *A. elegans* and *A. ridicula*. A collection of tropical species of this genus would be a most interesting feature in any large stove. Another large-flowered species, namely, *A. gigantea*, is now in cultivation, and will probably soon be available for collections generally. It has flowers nearly as large as those of *A. gigas*, *Sturtevantii*, but differs in habit, foliage and the absence of a tail.

LÆLIA MONOPHYLLA is a charming little species which was first introduced from Jamaica, where it is a native, to Kew in 1882, where it is now flowering freely. It is the smallest of all the Cattleyoid Orchids, the pseudo-bulbs being no thicker than a knitting-needle, three inches long, bearing a solitary leaf of the same length and a drooping one-flowered scape. The flower is one and a half inches across, not unlike that of *L. cinnabarina* in form, but more elegant, and colored rich orange-scarlet. A plant in a three-inch basket bearing five opened flowers is a picture. In Jamaica it is found at a high elevation, a fact which accounts for the preference the plant shows under cultivation for the conditions afforded in the cool Orchid-house along with the *Odontoglossums*, the temperature of the *Cattleya*-house being too high for it. It has been described under the name of *Trigonidium monophyllum*.

LILIUM LONGIFLORUM, var. *FORMOSANUM*.—This is one of the most beautiful of all Lilies. It may be described as *L. Harrisii* (the Bermuda Lily), with a narrow band of red-brown down the centre of each segment. It is very elegant, powerfully fragrant, and as easily cultivated as the Bermuda Lily. It is hardy in England, a good greenhouse plant, and at the same time, probably, is at least as suitable for tropical countries as any other Lily. For the trade growers of *L. Harrisii* it is probably a gold mine. I have lately seen a batch of about five hundred plants of it, which are the produce of the seeds of one plant ripened last autumn, and almost every one of these yearling seedlings is now producing a full-sized flower. The other forms of *L. longiflorum*, such as *Takesima*, *Brownii*, *Eximium* (*Harrisii*) and *Chloraster*, are all in flower now. There can be no longer any reason for keeping *L. Brownii* up as a species distinct from *L. longiflorum*. Among the plants of the variety *Chloraster* lately sent to Kew from Western China by Dr. Henry there are some very similar to *Brownii*, others approximating to *L. longiflorum*, and others suspiciously like *L. Wallichianum*. All the above-named are good garden Lilies, the most refractory being, perhaps, *L. Takesima* and *L. Brownii*, while *Eximium* and *Formosanum* are the best.

HYDRANGEA PANICULATA, var. *GRANDIFLORA*, and *CAMPANULA PYRAMIDALIS* well grown and in flower make, when arranged together, a most beautiful group in the conservatory. They are both hardy, of course, and both easy of culture, but, like many other plants of the same category, they pay for special treatment. The *Hydrangea* is greener and healthier in foliage, and larger and purer in flower when grown in pots and flowered under glass than it usually is when planted permanently in the open border. A group of these two plants in the Conservatory at Kew is greatly admired. The *Campanulas* are five feet high, and each plant has from three to five crowded spikes of rich blue flowers. The *Hydrangeas* are bushes a yard high, with from six to twelve grand trusses of pure white bloom.

BEDDING BEGONIAS.—The valuable qualities of the *Begonia* for summer-bedding have only recently been discovered. The tuberous kinds are now almost as prominent a feature in the flower-beds as the Scarlet *Geranium*, and, judging by the numerous new sports now on trial at Chiswick, their popularity is likely to increase. Among the latter I noted the following as distinct and useful: *Multi-flore l'Avenir* (Lemoine), plant only four inches high, with numerous spreading racemes of double crimson flowers; *Madame Louis Urban*, a deep pink-flowered variety, similar in habit to the preceding, and *Rosa multiflora*, a still

paler pink of the same character. Besides these there were six other kinds of very dwarf, small-leaved, free-flowering bedding *Begonias*, all from Monsieur Lemoine, of Nancy. *B. semperflorens rubrum*, *Vernon's* variety, and *Crimson Gem* are two names for a plant which is likely to become a favorite as much on account of the rich Beet-like purple assumed by its foliage when exposed to full sunshine as for its numerous rich crimson flowers. All the *Semperflorens Begonias* are good bedding plants, although only few people appear to be aware of that fact. One might ask what is there that would not thrive in the open air in summer if good weather could be assured. I have seen *Acalyphas*, *Cassias*, *Bouvardias*, *Zephyranthes*, *Hymenocallis*, *New Zealand Veronicas*, *Plumbago Capensis*, all used with good results as bedding plants. It is astonishing how we cling to pot-cultivation under glass for hosts of plants which would be infinitely happier away from both pots and glass. [Several of the plants named above are not rare as bedding plants in America.—Ed.]

The HERBACEOUS BORDER has become almost an established feature now in all good English gardens. It is the cheapest of all styles, and if only a little judgment be used in the selection of the various plants to be grown it is one of the most delightful. Until recently there was no really good herbaceous border at Kew, but one was made this year on one side of a range of houses. It had been a border of mixed shrubs, dull and monotonous as such borders generally are, good enough to screen a wall perhaps, but otherwise of no interest. The shrubs were grubbed out, save only a few evergreens, to provide for winter effect, and such flowering things as *Spiræas*; the border was widened, trenched and heavily manured. When finished it was twelve feet wide and a hundred and fifty yards long. It is at the present time a grand exhibition of *Dahlias*, *Hollyhocks*, *Sunflowers*, *Sweet-peas*, *Roses*, *Phloxes*, *Pentstemons*, *Stocks*, *Carnations*, *Pinks*, *Antirrhinums*, *Celsias*, *Foxgloves*, *Rudbeckias*, *Poppies*, *Pæonies*, and other plants. The lawn in front of the border is already worn brown by the visitors who crowd to inspect the flowers. The harvest of bloom began more than a month ago, and it will continue for two months longer. Perennials must, of course, be well represented, but it is astonishing how much of summer-flower glory and variety can be provided by annuals, the seeds of which are sown in spring and the plants never shifted.

London.

W. Watson.

Cultural Department.

Notes on Shrubs.

AMERICAN amateur gardeners seem to be too ready to accept a popular idea that because Heaths and Heather do not naturally cover our waste grounds or moors, as in the Old Country, they cannot be made to thrive and bloom freely when introduced into the soil of the New World.

We rarely find a *Calluna* or *Erica* in an American garden, and yet if given proper conditions they will develop a very satisfactory growth, adapt themselves to their new surroundings, blossom freely in the month of August, when flowering shrubs are rare, and gladden the heart of every Scotchman or other enthusiastic lover of the Heaths of a former home.

Probably one reason for the prevalent idea that Heather cannot be successfully grown, when imported here, lies in the fact that there have been a great many small attempts to transplant them, almost every one of which has failed for some unknown reason. In too many cases full-grown plants have been dug up and brought over the ocean in pots, receiving treatment on the voyage which weakened them and prepared them for early decadence and death when planted in new and unfamiliar ground, and exposed to new climatic conditions. When growing from seed has been tried, the attempts have usually failed on account of a lack of knowledge of the proper planting of the seed and care of the young seedlings. It may, perhaps, be accepted as true that our climate is, as a rule, less favorable to their growth, because of the greater dryness of the air in summer, but there are many places along the sea-coast where the conditions do not seem very different from situations in which the Heather seems quite at home on the other side of the Atlantic.

The severity of our winters is no barrier, for we have the plants growing well without protection in Massachusetts, and it is recorded as growing without man's care on the coast of Maine, in Nova Scotia and Newfoundland. The patches of plants which have been found growing in these stations were once supposed to be indigenous, but, as Dr. Goodale has shown in his interesting article, published a couple of years ago in GARDEN AND FOREST (vol. iii., p. 62), there is reason to believe that all have started since the arrival of European immigrants and owe their existence to the intentional or accidental work of white settlers.

Many of the failures which have attended the attempted cultivation of Heather have undoubtedly been due to planting in unsuitable soil. The roots of plants of this family are generally exceedingly fine and delicate, and they require an open sandy or peaty soil with plenty of moisture; a heavy clay soil is fatal to them. Undoubtedly, the best method of introducing Heather is by means of seed. If one wishes to merely sow the seed broadcast and allow the plants to take care of themselves, a corner of a Cranberry-bog is probably the best place that could be selected, particularly if it is kept free for a time from rank-growing grasses and weeds. The seed may be simply scattered without any attempt at covering, as it is likely to fall into the little interstices in the ground, which will be filled by the first good rainfall. To grow the plants from seed artificially requires some attention and care, and should ordinarily be attempted only in a greenhouse or with the aid of a shaded and glass-covered frame or box. A good soil is composed of about equal parts of clean fine sand, peat and loam, and it should be well drained by having a thick layer of broken pots or brick beneath, with a layer of dead moss or sphagnum between the soil and drainage to prevent choking of the latter.

When the seed is sown it should have the slightest possible covering of fine soil evenly sifted over it, merely sufficient to cover it from sight. It may then be thoroughly watered with a very fine spray, and the surface of the soil should never be allowed to become dry at any time until after the seed has germinated and the little plants have formed good roots, after which they must not be allowed to suffer for want of moisture. It is sometimes a good plan to cover the beds with a layer of damp sphagnum until the seed begins to germinate, and when this period arrives the sphagnum must be removed at once. Shading the bed with a piece of matting placed a little above it answers about equally well for the shelter of the seed-bed and seedlings, and it is necessary to use the matting in shading the young seedling plants where the sphagnum has been earlier employed. After the seedlings are well up the glass may be raised or removed. When the plants are perhaps about an inch high, if growing thickly together, they should be carefully transplanted to fresh boxes or beds of prepared soil, giving them more room for growth; it is well to transplant two or three times before permanently planting out. If the plants are not kept in too active growth late in the summer, and have matured good woody stems, even though very small, they may be safely wintered in a frame by giving a covering of leaves or coarse hay; or if they have been grown in boxes in the greenhouse, they may be placed in a pit for the first winter, after which they may be planted out in prepared beds. If properly cared for, they should form good strong plants in two or three years, ready to begin blossoming and to be planted out where they are to remain permanently.

In a very large proportion of our country the soil is of a limestone or clayey character, where Heaths would be sure to fail unless a bed was specially prepared for them. It should be dug out for from two to three feet in depth and filled in with about equal parts of peat and clean fine sand. Soft or rain water should be used as much as possible when watering; hard water would probably be disastrous to the plants.

Where plants are already available, they may be multiplied with less trouble and more expeditiously by cuttings of the tender tips of the shoots taken at this season, and planted in pots or boxes of sand, or sand and peat, provided with good drainage, kept under glass and reasonably moist. The cuttings may be about an inch long or a little more; they should have the lower leaves removed, and should form good roots before winter. Where only a few plants are wanted from a parent plant they may very easily be obtained by layering. Propagation by cuttings or layers is absolutely necessary in increasing any peculiar form of a species, the Heather (*Calluna vulgaris*) having furnished several which are perpetuated by European cultivators. Among these there are forms with darker-colored flowers than the type, others with white flowers, while a very pretty form has double blossoms. Then there are forms which have been selected on account of their habit of growth, some being prostrate, others more erect and taller than the average,

while such forms as have been named *Pygmæa*, *Foxii* and *Densa* grow in pretty, compact, very dwarf tufts, but produce few flowers. This species of Heath is probably the hardiest and best for northern amateurs to experiment with in this country. After success has been attained in the cultivation of the more vigorous *Calluna*, other less vigorous and seemingly less hardy species of *Erica* may be taken in hand with every chance of some satisfactory result and pleasure.

Arnold Arboretum.

J. G. Jack.

The Wild Garden in August.—I.

THE wild garden is always interesting; it is nearly always beautiful, and its appearance undergoes a complete change every month of spring, summer and autumn. There is a great wealth of yellow flowers at this season, a predominance due to the large number of *Compositæ* in bloom. Several species of the Rosin Weed (*Silphium*) make a good display, but, as these are coarse-growing plants, they are out of place in any but large gardens. *S. perfoliatum*, the Cup Plant, is conspicuous on account of its ten feet of stem and bold ovate leaves. It is massive and striking in strong clumps, the yellow flowers, three inches in diameter, being borne freely at the top of the mass of luxuriant foliage. *S. trifoliatum* is not so tall by four feet, and its lanceolate leaves are smaller; but its similar flowers are produced in even greater profusion. The Compass Plant (*S. laciniatum*) is about five feet high, with flowers of a clearer yellow color than any of the others, and four inches across. The lacinate, hoary leaves, on long petioles, are from one to two feet in length, and they give the plant a quite distinct aspect. Some other interesting kinds will not bloom until a few weeks later, and thus their flowering period is prolonged. Large groups of these plants look well on the lawn, and they are admirable when associated with tall shrubs. They like a deep soil, and suffer but little from drought.

Heliopsis lævis, the Ox-eye, is very floriferous and showy, and a good plant for the herbaceous border. The stems attain a height of about four feet, forming a compact, shapely cluster when tied to a stake some inches shorter. The opposite leaves are ovate-lanceolate, of pale green color, and the rich yellow flowers, measuring three inches across, are excellent for cutting. The plant requires no special culture, and thrives well in any soil save that which is excessively light. *Lepachys pinnata* is similarly attractive and useful. It is hardly so robust as the *Heliopsis*, but more graceful. The elegant leaves are pinnate, and the drooping, pale yellow ray florets, with the conspicuous black sphere which constitutes the disk, give the flowers an agreeable charm. A large mass of this species is now a pleasing feature of the wild garden, the plants having been allowed to develop in their own way.

It would be difficult to pass the *Rudbeckias* without saying something in their favor, more especially as one of the species, *R. speciosa*, the gem of the genus, holds a foremost place among our herbaceous plants. It is from two and a half to three feet high, and absolutely covered with flowers three inches across, the outer florets deep yellow, and the large cushion-like disk dark purple. The leaves are ovate or lanceolate, but now hidden to a great extent beneath the close covering of golden flowers. *R. maxima* is a decidedly different plant, the stems of which are about five feet high, clothed with oval glaucous leaves (petiolate at the base and clasping above), and bear solitary flowers at the extremity. The cone-shaped, deep purple disk is fully two and a half inches high, the drooping ray florets two inches long, very broad, and of a clear yellow shade. This species is not at all common in gardens, and it well deserves more attention. It is singularly handsome when grown in quantity, and as a border-plant its merit is undeniable. *R. laciniata* is also desirable, being a free grower of stately habit, and producing its bright yellow flowers in great abundance. The *Rudbeckias* thrive well in ordinary garden soil, but they are partial to a position which allows them plenty of light.

An imposing mass of green and white is afforded by *Parthenium integrifolium*. The leaves are quite large, furnishing the stems to the base of the great flattened clusters of white blossoms, which, individually, are rather insignificant, but very effective in the mass. The plant is about four feet high, and grows luxuriantly in heavy soil. There are only a few straggling flowers remaining on *Asclepias tuberosa* to remind us of its brilliance in July. It was then one great mound of fiery orange-red blossoms, now replaced by pods which will, later on, give a good supply of seeds—the principal means of effective multiplication. It is a grand plant for dry, hilly situations, and so is *Opuntia Rafinesquii*, the best of the few Cacti which are hardy in this latitude. This Prickly Pear is ex-

tremely floriferous, the blooms being of a yellow hue with reddish centre.

But a small number of the Asters have as yet shown their blossoms. *A. macrophyllus*, a species with very large cordate leaves, about two feet high, was the first to flower. Its rays are of a whitish or lilac tinge, and the flowers are now at their best. It was closely followed by *A. corymbosus*, a similar plant with smaller ovate leaves and white flowers. *A. Herveyi* and *A. ptarmicoides* will soon be in full bloom. The ray florets of the former are violet, and those of the latter, which is an exceedingly graceful plant, pure white. The large pale blue flowers of *A. Lindleyanus* are just beginning to expand, as are the rosy purple blossoms of *A. Novæ-Angliæ*, one of the most beautiful species in the entire genus.

Solidago arguta is the only one of the Golden-rods whose full complement of flowers has appeared so far. It is a very pleasing plant, about three feet high, and most desirable on account of its early flowering. The flowers are of a lively yellow, leaves bright green, and the habit compact.

Cambridge, Mass.

M. Barker.

The Water-garden.

AQUATICS are still the centre of attraction with their ever-renewed flowers, variety of color and the general animation which is never so marked in formal flower-beds. The Lotus (*Nelumbium speciosum*) always commands the first attention, as its noble flowers in the morning sun tower above its foliage, which is quite as noble, while the modest night-blooming *Nymphæas* hide their faces until the brilliant light is past. No aquatic has been more satisfactory this season than the Lotus, and none has required so little attention. Medium-sized roots have made rapid growth and flowered profusely, and are now established; but it is a question whether it would not be better, where cold winters render them uncertainly hardy, to make shallow tanks, eighteen inches to two feet deep, and plant every season. And yet the Lotus seems difficult to start in some places, and I have had the same trouble here when I buy dormant roots. I find no trouble when planting them in shallow water, and filling up as growth advances. For deeper water, plants with stronger growths and numerous roots can be used with safety. In all cases the water requires to get naturally warm to start active growth. The season was somewhat backward for planting, and it was the latter part of April before the roots above mentioned were planted, but they were flowering well the latter part of July, and will continue for some time. With few exceptions, the flowers are as large as those planted the previous year.

It is particularly necessary to have the tanks and ponds well stocked with fish. In tanks where I had few fish I had an abundance of Dragon-fly larvæ, which punctured the young growth and flower-buds of *Nymphæas*, and, of course, deformed them seriously when they were open.

One of the most ornamental of the Arrowheads is the double form of *Sagittaria Japonica*, which is now in flower. It will succeed admirably in a tub that is water-tight, or it may be planted in moist places or on the edge of the Lily-pond. The flowers are pure white, perfectly double, as large as a Carnation, and produced abundantly on a scape similar to that of our native species.

Dongan Hills, N. Y.

Wm. Tricker.

Francoa ramosa.—The *Francoas* are natives of Chili and belong to the Saxifrage family. There are but three species, and all are perennial but not hardy here, though they might be successfully cultivated in the more favored sections of the eastern states as they are in some parts of England and Ireland, where they are grown as border-perennials. These introductory remarks are necessary, as I know of no firm in this country that offer either seeds or plants of any of the species. Our seeds were obtained from Mr. W. Thompson, Ipswich, England. The popular name given to the plant in question is Bridal-wreath, owing to the long-branching sprays studded with pure white flowers, and it is surprising that florists have not taken the plant in hand, for it would be invaluable for summer cutting, either for indoor use in vases or for any other purpose for which cut flowers are desired.

Francoas are best grown from seeds which germinate readily, and the plants may be potted off separately and grown on to seven or eight inch pots, as they may require. The treatment given *Calceolarias* and *Cinerarias* would suit them well for the winter months. During the following summer the plants will bloom freely, producing as many as twelve sprays to a plant in a vigorous specimen, each spray being about

three feet long and flowering for two-thirds of the length. For grouping among other plants, either in the open ground or in the conservatory, nothing can be more admirable than *Francoa ramosa*, the flowers of which are pure white. *F. appendiculata* is another species with flowers that have a tinge of red with the white. The sprays are not so erect as in *F. ramosa*, but spread more freely and produce a very pretty effect when blended with other plants.

The only other species is *F. sonchifolia*, with which I am not acquainted, but it is said to be equally good, resembling *F. appendiculata* in the color of the flowers.

The season of flowering has lasted over two months with us, and this is a good time to make cuttings of the offsets from the old plant, many of which can be procured with roots. They may be treated as young seedling plants in every particular, and should flower next summer. Seeds are also produced freely here and may be sown as soon as gathered. As they are small, they may be treated in the same way as the seeds of the *Calceolaria*.

Melianthus major.—I see Mr. Gerard notes the beauty of *Melianthus major* as an ornamental foliage-plant. Too much cannot be said in its favor for this purpose. A word should be added as to the way to obtain or propagate the *Melianthus*. Only those who have tried cuttings know how difficult they are to root. It is rare, indeed, for any one to succeed in raising them in this way. I find that the seeds germinate as readily as those of the Castor-oil-plant, and make fine young bushy plants for use the same season. Our seeds were procured from the same source as the *Francoas*, and produced a nice batch of plants, one of which was left out last winter in a *Rhododendron*-bed and carefully protected with leaves, but it died.

In Ireland the *Melianthus* is perfectly hardy, and it probably would be equally so in many parts of the United States. It would pay some one in the south to cultivate the plant for the production of seeds, as with the *Grevillea robusta*. There would be a ready sale for the seeds when the plant became better known for use among summer decorative planting. Old roots lived over with us in the cold frame last winter after being lifted and cut back, and are now in the open border. With regard to *Grevillea robusta* a reliable English firm states that "seedlings are easily raised by those who can exercise patience, but we do not know any seed—not even the *Auricula*—which is so long and so capricious in germinating." They probably have to depend on seed from New South Wales, while seeds obtained here from trees growing in Florida germinate as freely as Radishes. Seeds that are imported from the antipodes are difficult to manage, and rarely germinate well, if at all. We have tried many kinds, but with indifferent success.

South Lancaster, Mass.

E. O. Orpel.

Tradescantia Warscewicziana.—The larger number of the greenhouse species of Spiderworts are cultivated for their ornamental foliage, but the species under notice not only deserves to be cultivated for its foliage, but also for its beautiful flowers. The plant in flower here is only a small one with a single stem, and was obtained from the Botanic Garden, Edinburgh, about twelve months ago. When the plant gets older it forms a branched sub-arborescent, stout stem, with recurved leaves, having a good deal the appearance of an Aloe. The leaves are about eight inches long, narrow-oblong, acuminate and sessile. The flowers are of a bright purplish rose color, and are produced on a densely crowded branched panicle. Although the flowers are small they are very effective, owing to their density, and as they do not all open at the same time, but in constant succession, the blooming season is of long duration. The cultivation of this plant is very simple; it will grow in any rich, open soil, but needs plenty of water at the roots. This is really a good greenhouse plant, and deserves a place in every collection, especially when it is old enough to form a branched stem. It can be increased from cuttings.

Costus igneus.—Although this plant was introduced from Bahia in 1882, it has not become common, and is very little known in gardens in this country. There is no reason why this *Costus* should not become a popular plant, as its cultural requirements are very simple. If potted in ordinary compost and given the same treatment as the general run of stove-plants it will both grow and flower freely. At this season of the year the bright orange-red flowers, which are different from any other of its associates, stand out conspicuously among stove-flowering plants. The roots of this plant are thick and fleshy, and they form a strong crown from which the stout, erect stems are pushed up to a height of from

eighteen inches to two feet, and are terminated by the head of blossoms. In the cone-like head of blossoms the flowers do not all open together, so that the flowering season is prolonged. The individual flowers are one and a half inches in diameter, and in color bright orange-red, two or three flowers are open together on the same stem, so that when a large plant is obtained they present a showy appearance. Like most of the other members of this genus, this species has also beautiful foliage, which is of a bright green color. It can be easily increased in spring by dividing the roots.

Botanic Garden, Cambridge, Mass.

R. Cameron.

Correspondence.

Some Questions About Taste.

To the Editor of GARDEN AND FOREST:

Sir,—I have read with care your editorial on the subject of "Taste Indoors and Out," and beg to ask a few questions on a subject so fraught with interest to all who seek to beautify their places in the right spirit.

To begin with: How are we to know what is right and what is wrong? We do not all have a landscape-architect at hand to consult, and he is at best an expensive luxury, then what is to be the criterion of excellence? Taste is so much a matter of individual judgment that one person likes what another hates, and we are very unwilling to take another's ideas, unless we are quite convinced that he is an authority. You are right in saying that it is a good thing for women to interest themselves in this subject; but how are we to know what is un-beautiful from the highest standpoint? Our views about what constitutes an attractive drawing-room arrangement differ very widely, and there we are in a sense at home, but one woman likes ornament and succeeds in it; another disdains it, and produces a dignified and interesting effect without it; and it is more or less the same in our grounds.

Now, can you not tell us what to avoid and what to aim for in our gardens and places, and by what means we can attune our minds to such manliness of conception as shall produce a good result even on an estate? Are we women to be confined to the petty and the pretty forever, or may we not aspire to the loftier walks of landscape-gardening, even as some of us venture to try issue with senior wranglers in the higher mathematics?

Admitted that women are deficient in creative ability, where is the school in which we can learn at least the rudiments of an art so important as the proper planting of our grounds? Why can there not be schools of landscape-art as well as schools of architecture for our enlightenment where we can investigate the proper composition of a rockery or the exact formula for planting a bosquet?

If there is a rugged old tree in the neighborhood of my house, how am I to know whether its picturesqueness is in tune or out of key with its surroundings? At just what distance from the house should the natural give way to the formal? If I like a group of boulders on the edge of my terrace instead of a formal wall, how am I to be sure that my taste is faulty, and the authority who prescribes masonry instead of the boulders to be accepted unhesitatingly?

I think the trouble is that there is no law, and hitherto no inspired councils. The fact is, the fathers of landscape-gardening ought to hold such a council and give us the canon, and let it be infallible. I am not of those irreverent doubters who declare that the wisdom of men in council is no greater than the wisdom of each one taken separately; I am prepared to accept the faith devoutly, if only our Vatican will speak and let us know what is true orthodoxy. The trouble is, we are kept running after the Lo, heres! and the Lo, theres! and a dissenter's views are pronounced with as much confidence as those of the regular doctors, so that really we can't help getting "balled up," as the Andover men did about sheol at the time of the great discussion.

What is taste is really almost as hard a question to answer as what is truth, and if we once get on the wrong track there seems to be no reason why we should ever be led into the right one except by some happy accident.

How are we to distinguish taste from fashion, ephemeral beauty from that which is lasting? What is the test to apply to arrangements of trees and shrubbery, in which there is admittedly great variety permissible? There must be something, as there is in art, which makes things good or bad, excellent or violent, apart from individual fancy or the passing mode, and it seems desirable to find out what is the standard to which the wise and willing may repair with complicated

problems in composition, and have their doubts solved, and their taste uplifted on the spot.

Mr. Ruskin says that a person may not consider himself a critic in art until he can go at full speed through a gallery and know without stopping which pictures in it are important. I suppose, really, the truly cultivated landscape-architect can go galloping through a country-seat and know that it is dreadful without even looking at it, but minor mortals have to take their Louvres and Luxembourgs moderately and think twice before they know an early Raphael from a Perugino, and it is the same in a garden. I know people who actually like Horse-chestnuts and Purple Beeches, and are capable of planting groups of incongruous trees, and sticking to it that they look well together. How are such to be confounded and reduced to a proper state of mental receptiveness so that they will become capable of taking in new ideas? We all feel that GARDEN AND FOREST is doing a great work in that direction, but the more active our minds become the more we are disposed to question our teachers, and ask chapter and verse for the faith that is in them.

Nor do we do this in any carping spirit, but rather that we may ourselves lay hold on truth, not tentatively but with precision, growing in security and knowledge. Probably, if the landscape-gardeners could put their theories into words they would not do it, for it might spoil the business, but it would be interesting if we could get them to tell us what guides them in their decisions, and what we ought not to do.

Most people do not have time to do the requisite thinking to plan their places successfully, and therefore they relegate to a professional what might be an expression of their own individuality if they would put themselves into it with zeal. There is also the difficulty that trees are unhandy things for an amateur to experiment with, and one feels timid about dealing with them in any unconventional way, and so hesitates to make any very unusual disposition of them; neither can they be whisked about for nothing, but require men and money to deal with them successfully. Shrubs are somewhat easier, and what you aim at is more promptly attained; but even in the flower-garden we fail to see much that shows individuality of treatment, or even novelty of effect.

If this is to be a business for women, we really ought to begin at the beginning and understand how to go to work, and the editor of this paper is just the person to give us a few elementary lessons in the profession we are so eager to practice, and apparently in his eyes so little qualified to adorn.

I suppose the true way would be for us to begin with the flower-garden as a sort of primary school, and when we show some real aptitude in that we might be promoted to the intermediate department of shrubs, while only those who were graduates from both these schools would be entitled to go up higher and deal with trees in their proper relations to each other.

As to lessons in taste, those would have to be extras. I doubt if this country is far enough advanced to make a school of taste possible, and yet I am not sure but that it would be as much to the purpose as a school of philosophy. In our modern Athens, a peripatetic professor, illustrating his lectures by walks through the Public Garden and the Back Bay Fens, with occasional excursions to outlying parks, that might serve as a warning or example at will, would be deservedly popular, and we feel that we at least have the men competent to enlighten us if only they had the will.

Hingham, Mass.

M. C. Robbins.

Plant-labels.

To the Editor of GARDEN AND FOREST:

Sir,—Some years ago I wrote to you for advice on the subject of plant-labels, and received a very courteous reply through the columns of your valuable journal. The subject of labels is such an annoying one to the amateur, and seems still to be so far from a satisfactory solution, that I venture to add a suggestion. I enclose a label that has stood for over two years in a most exposed situation, where it was subjected to the full rays of the sun as well as to the rain and cold. It appears to be as legible as when first inscribed; and the black writing on the polished white surface renders it most easy to decipher. The label was bought in Paris, and costs seven francs a hundred at retail. It is of ordinary celluloid and could, I presume, be made more cheaply in the United States. The ink is a patented article, and costs 1³⁵/₁₀₀ francs per bottle at retail. The completed label would thus cost about a cent and a half. I have not yet found any other label combining to so great a degree the elements of legibility, durability and cheapness. I may add that I have seen these labels used for years in dark and damp wine-vaults without any apparent deterioration in legibility.

I must ask you to return the label, as it is the only one I have, and I desire to use it as a sample in sending for others.

Oakdale, L. I.

C. B. W.

[The legend on this neat label is perfectly clear, and the ink does not seem to have faded or "run" a particle.—Ed.]

Meetings of Societies.

The Florists at Washington.

THE annual meeting of the Society of American Florists at the national capital last week was more numerously attended than any which preceded it. The report of Secretary Stewart showed that the membership of the society had increased during the year and its influence extended in every direction. Mr. William R. Smith, Superintendent of the Botanic Garden in Washington, was elected President for the ensuing year, and Professor Trelease, of St. Louis, was made Vice-President, and St. Louis was chosen as the place of meeting for next year. Mr. John Thorpe, the Chief of Floriculture of the Columbian Fair, announced that all the floor-space of the great Horticultural Building had been already taken up, and that exhibitors from abroad had shown a greater interest than the florists at home, and had already applied for more than half of the space to be disposed of. The trade exhibit was particularly good, and filled the large lower hall of the Armory where the convention was held. Excellent displays of Orchids and other choice plants were made by Messrs. Pitcher & Manda, of Short Hills, New Jersey, and by Mr. H. A. Dreer, of Philadelphia. The display of Tuberous Begonias by Mr. J. W. Elliot, of Pittsburg, was noteworthy, and so was a collection of Cacti by a southern firm.

We give below condensations of a few of the more important papers read, and will give others in a future number of the paper:

THE PRESIDENT'S ADDRESS.

The address of President Dean was a careful review of the year in its business and cultural aspect. He noted in particular, not only a growing volume of trade, but a demand for a better quality of plants required for bedding, such as Crotons, French Cannas, Tuberous Begonias and aquatic plants. Among the improvements of the year were noticed the adoption of regulations for governing trade exhibits held at the time of the annual meetings. These rules will help managers to classify the exhibits, will facilitate the work of the judges, and enable exhibitors to display their certificates on the evening of the first day. The offering of gold, silver and bronze medals for new hybrids or seedlings, or for the discovery or introduction of new seedlings, will, no doubt, prove an encouragement to floriculturists in the fascinating work of cross-breeding and obtaining new and improved forms. The great improvements made in the Chrysanthemum, the Rose, the Carnation and other flowers is attributable to the high standard adopted at floricultural exhibitions, and the formation of societies for the purpose of improving special plants, like the Rose Society, the Orchid Society and others, was to be commended, since they would prove helpful auxiliaries to the parent society, and it was recommended that at the annual meetings, experts in each specialty should review their work and record the latest developments in their particular fields as a part of the proceedings of the society.

After speaking of the colossal proportions which the business of commercial floriculture had assumed in America, President Dean recommended the establishment of an institution which would afford scientific training and general business education for young florists. Floriculture is a profession which, above most others, requires special training, and the time has come when young men should know more than the mere routine practice of the trade, and should be instructed in the scientific possibilities of plant cultivation. He further recommended the establishment of an experiment station to which florists could refer the vexed questions which constantly arise in their practice. It might be practicable, and, indeed, advantageous, to unite these two institutions so that the students and professors of the college would form together the working corps of the station. No better material could be provided for the laboratory research of the student than that which could be supplied by inquisitive and eager florists throughout the

country. An institution like this would become the organized centre of investigation and training, and it would give an impetus to the work of discovery and the dissemination of knowledge of plant life, and would help to establish floriculture in its true basis as a science as well as a business.

In speaking of the approaching World's Fair, President Dean said that the Horticultural Building, now ready for the reception of plants, is the largest one ever erected, and that it behooved the society to see that every aid was extended to Mr. Thorpe so that the exhibit can be made worthy of the occasion and of the country. The main difficulty to be faced is that of obtaining and transporting plants of sufficient size to show well in such an immense building. State and local societies were therefore strongly urged to induce public-spirited citizens who owned desirable plants either to loan or give them to the department.

FUNGOUS AND OTHER ROSE TROUBLES.

Professor Halsted, in treating of this subject, said that the various species and varieties of the Rose have their full share of fungous diseases, no less than 165 kinds which prey upon the genus being recorded in the books. The black spot is a very wide-spread disease of the Rose, first described in 1826, now known in many countries and much dreaded. The foliage when attacked soon develops black spots, and the leaves becoming elsewhere pale shortly fall to the ground. As a result, Rose-houses badly infested show few leaves and fewer blooms. The microscopic structure of this fungus has been fully considered in the first annual report by Professor Scribner, of the United States Department of Agriculture, for 1887. Experiments have been carried on by the New Jersey Station to warrant the assertion that it can be controlled by the carbonate of copper compound, using three ounces of carbonate of copper, one quart of ammonia and fifty gallons of water. The spraying should be done once a week, using a hose and a nozzle that gives a fine spray. The point should be to wet every part of the plant, and yet not drench it. If many leaves have fallen from the plants they should be gathered up and burned. As with many other diseases, some varieties are more liable to the black spot than others. Within the past week the black spot has been observed by Professor Halsted upon a species of wild Rose (*Rosa humilis*).

Powdery mildew of Rose (*Sphaerotheca panosa*) is one of the oldest troubles of the Rose. This develops very suddenly on the foliage in the greenhouse or outside of it, giving the leaves a powdery appearance and causing them to become more or less misshapen. In a mild form the foliage may be only mealy, but frequently the surfaces become uneven and the whole leaf twisted. A remedy has been found and long applied in the shape of sulphur in one form or another. Professor Maynard, of the Massachusetts Experiment Station, finds a small kerosene-stove the most convenient for this purpose, and the sulphur, by means of it, is boiled in a kettle for two or three hours twice a week, the house being closed during the operation. The only precaution is to use no more heat than is sufficient to boil the sulphur, for should it catch fire it might damage the plants. In the *American Florist*, for July 7th, Mr. John N. May writes that the best way to get rid of the mildew is to close the house about eight o'clock in the morning, run the temperature up to seventy-five, then with a bellows fill the house full of sulphur, let it remain closed until the temperature reaches eighty-five to ninety, then admit air gradually. A constant circulation of air is likewise recommended for Roses at all times. Potassium sulphide, one ounce to two gallons of water, sprayed upon the plants, has proved effective. Gardeners, from long experience, have come to the belief that Rose mildew is induced by a weak condition of the plant, resulting from partial starvation, irregular or excessive watering, and undue exposure to draughts of cold air.

Downy mildew of Rose (*Peronospora sparsa*) differs in many ways from the one just mentioned. It is less easy to detect, and, being more deeply seated, may do greater damage before detected than the powdery mildew. It is less easy to eradicate because it thrives within the substance, while the *Sphaerotheca* feeds superficially. The *Peronospora sparsa* is a close relative of many of the most serious mildews, as those of the grape, onion, lettuce, spinach and the rot of the Irish potato. The treatment for this is the same as for the anthracnose, to be mentioned later.

A Rose rust (*Phragmidium mucronatum*), similar to the rust of wheat, oats and other grasses, is not common in our section of the country upon indoor Roses. It is not unlikely that it may become a pest here, as it now is in California and other states in the Union. The pest has been so violent in its

attacks upon Roses in California that even the canes were blistered, the whole being covered with a mass of orange-colored spores. Cutting and burning all affected plants is the only safe treatment.

A kind of anthracnose (*Glœisporium Rosarum*) sometimes attacks the Rose when the leaves are small and pale, and the canes die at the tips. Sometimes the stems may be dead for a foot or more from the extremity. Not infrequently one branch will be dead clear to the base, and sometimes two or more are thus destroyed. The dead twigs show pimples quite evenly distributed over the surface, and from some, a minute, often curved, horn of a reddish color protrudes. When such stems are placed in a moist chamber the whole decaying surface becomes closely covered with numerous almost brick-red masses of spores, and the disease spreads rapidly through the adjoining parts of the twigs that seemed healthy when placed in the moist chamber. The fungus spreads so rapidly that in four days from the time spores were introduced into sterilized sections of Rose-twigs in test tubes the whole of the culture would be covered with the spore masses. This anthracnose appears to be new in that it has not been before studied microscopically.

Eel-worms, or nematodes, often work on the Rose, principally at and in the roots. These microscopic worms are in outline like that of an ordinary eel, and under the microscope are seen in almost constant motion. They cause an enlargement of certain parts of the roots, and by means of these galls or knots are easily detected with the naked eye when a plant is removed from the soil and carefully washed of the adhering earth. In order to get rid of the pest it will be of much assistance to know where the worms come from. They are, as a rule, much more abundant in warm climates than elsewhere, and the unusual abundance of these pests in northern gardens for the past two years is likely due to the lack of freezing of the soil. The greenhouse furnishes the proper conditions for the propagation of the eel-worms, provided they are there to begin with. This naturally raises the question of how they first get into the bed. They may be already in the roots of the plants, but in small numbers, when the plants are placed in the house. To guard against this the roots should be examined as closely as possible for the galls when the beds are set. All galled Roses should be excluded. The nematodes may come in with the earth. They infest a large number of kinds of plants, and it is an easy matter for them to come with the soil. Soil that has not been used for growing plants in the garden is not necessarily free, but may, if taken from a pasture or meadow, contain many nematodes. Then, again, they may be taken with the manure that is used. Cold, in excess, will probably destroy the worms, and likewise a high temperature is fatal to them. Both of these conditions may be impracticable to apply to the soil, the one being impossible in some cases, and the other too expensive. Rose growers might make the experiment of heating the soil of a small portion of the bed before setting the plants and satisfy themselves if such a treatment will pay. If manure is the chief vehicle of the worms it may be possible to grow Roses without so much of this constituent of the rose-soil. It may be that Roses can be grown with a burned soil to which all the necessary elements of plant-food have been added in the form of commercial fertilizer. The fact is, that the worms are doing much damage. When they are once in a plant there is no known way of driving them out. New conditions may induce the formation of new roots and a sickened plant may revive, but recovery is not usually to be expected. It is possible that some substance may be put upon the soil that, while not injuring the Roses, may kill the worms not already in the plants. Lime has been thus used and with favorable results. It is sprinkled upon the surface of the bed or better mixed with the soil, and each watering will tend to bring it in contact with the tender bodies of the worms. It is not unlikely that some fertilizing compound may be found that will furnish food for the plants, and at the same time deal a death-blow to the nematodes. Kainit may thus prove an efficient remedy, and it only remains for some enterprising rosarian to take the matter in hand and make a test of it. All that has been said regarding the habits of the Rose eel-worms applies equally well to those of the Violet, Coleus, Lantana, Bouvardia, Geranium, and a long list of other plants that are frequent or occasional victims to the same trouble. The treatment will vary with the nature of the plant, whether annual or perennial, woody or succulent, large or small.

FLORICULTURE FOR CHILDREN.

Mr. Robert Farquhar, of Boston, read a paper to show how and why children should be trained to love and cultivate flow-

ers. He argued that we could either stifle or strengthen the love of nature which was implanted in every young heart. If we encouraged and cultivated this love the mind of the growing child would be opened to the beauties of nature, and we should in this way provide for it a means of healthy exercise out-of-doors and a source of delightful recreation all through life. Children should have gardens of their own to care for, and they should be instructed in garden practice. They should be allowed to sow the seeds and care for the plants themselves, although they should be directed in all these operations. Florists who do business in villages and towns enjoy opportunities for doing effective work among children by explaining to their young visitors the manner of propagation by sprouting seed, or by setting out the young plant with its new-found rootlets from the cutting-bed. Subjects for explanation are ever at hand, and the florist who takes pains to instruct his little visitors will often make friends for life, and probably customers, too. The claims of children should never be forgotten in making up the lists of premiums for horticultural and agricultural fairs. Prizes should be given for plants grown by them and for bouquets and collections of wild flowers made by them.

Village improvement societies are doing excellent work in many sections. Some have distributed seeds and plants to the school children with most satisfactory results; florists should profit by this example. Any florist who so wills can begin an effective village improvement society of his own without expense of time or money. Usually the unsalable surplus of bedding-plants is thrown away at the end of the planting season. Why not give them away to the school children? Let the teacher make it known that at a certain time the distribution will be made. When the eager company has assembled it will take but a few minutes of time to give one or more plants to each. Could a happier disposal of stock, useless to the florist, but valued by the children, be made? The satisfaction experienced will more than pay for the inconvenience, and the giver has made an effective and enduring advertisement. Unquestionably, the greater number interested in floriculture the larger will the demand become for both flowers and plants. Children soon grow up into patrons and are worth cultivating if for business only.

Members of this society should make a united effort to have the claims of floriculture for children, and kindred subjects, recognized in all our schools.

The merchants, lawyers and ministers who usually make up our school committees rarely seek to influence education in the interests of horticulture or agriculture. It is book-learning from beginning to end. As a consequence, we have a large surplus of middle-men, and men who live by their wits. Small wonder, then, that a large proportion of our best all-round gardeners originally came from abroad. In most European countries school-life fosters a practical acquaintance with Nature. Our children here love the beauties of nature as dearly as any, and our schools should foster such love instead of checking it. As an agricultural country America stands in the front rank, and the prosperity and wealth of the whole country depend upon the prosperity of those who till the soil; but these facts are entirely lost sight of in our schools; at least, no training is provided which bears directly upon them.

On this side of the Atlantic we justly pride ourselves upon being in advance of European countries in most attainments. We are very far behind many of them in the important matter of horticultural education of children. In France there are over twenty-six thousand primary and elementary schools where gardening is practically taught in gardens surrounding the school-houses.

In Austria there are about eight thousand of these schools, with from one-half to two acres each of cultivated land around them. The grounds in the rear may be found planted with a large variety of trees; at the sides and front are shrubs and flowers. One may see the teachers and pupils mingling together, studying interesting lessons based upon these plants. It has been said that boys will sooner injure a tree than cultivate it, but Mr. Farquhar said he should not be afraid to risk his trees with the boys educated at such a school.

Our country is young, but it is rich and progressive. The plain old school-buildings are going, and elegant buildings, with costly appliances, are taking their places. But we should not be content with fine buildings, large playgrounds and good teachers. In this country more than any we need the proper setting of ample grounds, filled with shrubs and flowers to bloom from earliest spring till winter. Instead of books alone, we should see to it that our children have ample opportunities for enjoying a lesson from the book of Nature.

Notes.

The tenth regular meeting of the American Horticultural Society will be held at Chicago on September 28th, 1892.

The Minnesota Forestry Association will hold its annual meeting at Minneapolis on the 8th of September, and the American Forestry Association has been specially invited to send a delegation. A large forest-reservation has been asked for in Minnesota, and it is a good field for energetic work.

The bulbs of the Ascension Lily (*Lilium candidum*) should now be lifted if new beds are to be made. In fact, they should have been lifted in this latitude nearly a fortnight ago, or as soon as the tops were dead and before new roots begin to start. If the lifting is delayed until later, leaves will have been formed which remain green all winter, and the plants will receive a check which they will not get over in a year.

Messrs. Sander & Co. have dropped the varietal name *Schroederiana* which was formerly attached to a good variety of *Dendrobium Phalaenopsis*, because many other varieties—some of them superior—have been introduced by this firm. *D. Phalaenopsis* is now known as a very variable yet very beautiful and well-marked Orchid, and a plant of it in Kew just now has twelve flowers on a single spike with numerous buds.

One of the famous great ancient Oaks of the Home Park, at Hampton Court, near London, was recently almost entirely destroyed by fire, although the firemen of the palace were aided in their efforts to save it by the steam fire-engines of Kingston and Surbiton. In local belief this tree was eleven hundred years old; it was declared to be one of the eight largest trees in England, and it measured thirty-three feet in circumference.

In answer to a question, Mr. H. E. Chitty, of Paterson, New Jersey, stated at the recent convention of the American Florists that the best twelve Carnations are: Lizzie McGowan and Silver Spray, white; Grace Wilder, pink; Daybreak, soft pink; Tidal Wave, deep pink, bordering on magenta; Portia and President Garfield, scarlet; Ferdinand Mangold, crimson; J. J. Harrison and American Flag, variegated; Golden Gate and Buttercup, yellow.

The Cardinal-flower which now gleams from the tangled foliage along the banks of mountain-streams, or almost startles one who comes upon it amid the rich green of moist meadowland, will thrive luxuriantly when lifted and transplanted to higher and drier soil. Some flowers, however, never look happy in trim gardens, and *Lobelia cardinalis* is one of these. Something of the wild grace and charm which invests it is lost when it is removed from its natural surroundings.

A late number of *The Garden* contains a good colored plate of the Azalea Hexe, which is a hybrid between the Chinese *A. amœna* and one of the Indian Azaleas. There have been a great many hybrids between *A. amœna* and different kinds of Indian Azaleas, and since *A. amœna* is a perfectly hardy plant it would be interesting to know how many of these hybrids have been tried out-of-doors in this country. These smaller-growing Azaleas are of neat habit, forming dense twiggy bushes, and they flower with great freedom.

In the early days of Spanish rule the Vine was extensively cultivated in Honduras, and excellent wine was manufactured there. But the very excellence of the product was the ruin of the industry, for, in the belief that Honduras competition might crowd Spanish wines out of the market, an edict was sent out from Madrid that every Vine in the dependency should be plucked up by the roots. This edict is still in the possession of the Honduras Government, and it is only of late years that Vine-culture has again been established in the country.

"Under the direction of Colonel Frank J. Parker, of Walla Walla," says a Chicago paper, "a large amount of Flax-seed will be planted in Washington and carefully cultivated for exhibition at the World's Fair. The flax will be shown in all stages of growth and manufacture. The fibre will be sent east to be worked up into souvenir fabrics, which will be exhibited in the Agricultural Department and in the Washington State Building. Colonel Parker, who is an enthusiastic advocate of Flax-culture in the state, will bear the expenses of preparing and making the exhibit."

What promises to be one of the finest drive-ways in the country has just been begun at Bayfield, Wisconsin. "This new boulevard," says a western paper, "will extend from Washington Avenue, directly in front of the Island View Hotel, along the lake-shore for about eight miles to the Redcliffe Indian Reservation, and will afford a magnificent view of Bay-

field Harbor and the Apostle Islands for the entire distance." It will be called the Dalrymple Boulevard in acknowledgment of the fact that it has been secured, after several years' efforts, by the diligent exertions of Mr. W. F. Dalrymple.

With regard to the Rose display at the current Horticultural Exhibition in London a correspondent of *Gartenflora* recently wrote: "What can I say about the Roses which fill the entire centre of the main hall? This exhibit of Roses was divided into nineteen classes, and one can only declare not merely that each class was richly represented, but that every blossom was worthy of special exhibition. Such symmetry of form and such splendor of color, as one expects only occasionally in exceptional flowers, were here universal. The first prize fell to Mr. F. Cant for a collection of seventy-two different Roses, among which each flower was not merely a picture but a model."

Mr. Carman writes in the *Rural New Yorker* that plants of a so-called White Blackberry, which he received from W. C. Raymond, Bridgewater, Vermont, have ripened fruit. The fruit is of medium size, and the drupelets large and comparatively few. The color is hard to describe, being not white but a pale whitish purple. The berry is peculiarly sweet, juicy and delicious, and as distinct in quality from ordinary blackberries as the flavor of the red raspberry is distinct from that of a blackcap. The plant passed through the winter well, although the last winter can hardly be considered a test. The thermometer drops occasionally to thirty degrees below zero in the part of Vermont where this plant was originally found, and it is therefore probably hardy.

Professor Bailey makes an appeal in *Science* for a broader field for botany, which has become restricted until it is little more than the science of wild flowers. But now that the doctrine of evolution has added a new purpose to the study of natural objects, cultivated plants are especially valuable for the examples they give of variation and of the effect of modified environment and selection. The common view that the variations in cultivated plants are anomalous, and therefore uninteresting, is erroneous. But apart from the fascinations which the cultivation of plants has in the direction of science, this cultivation demands the attention of botanists because horticulture ought to be nothing more than the application of the principles of botany. The fact is that it is quite impossible to separate horticulture and botany by any practical test, and, therefore, a department of botany should comprise laboratories, botanic gardens, greenhouses, orchards, vegetable and ornamental gardens, all maintained for purposes of active investigation rather than as mere collections. Botanists too often care little for gardening, and horticulturists are too often apt to underrate the value of scientific investigation. No man who does not unite scientific knowledge and practical training can appreciate the needs of botany in its broadest sense. No one can be a specialist in all subjects, but the ideal occupant of a chair of botany in the university of the future will have the genius to encourage and direct the work of specialists in every direction, and not until then can the science be actively presented to the student in its fullest possibilities.

The oldest herbarium in the world is in the Egyptologist Museum at Cairo, and consists of an inconspicuous collection of dried portions of plants. These portions of plants and flowers were taken from wreaths and garlands in the coffins with mummies, where they were placed by the ancient Egyptians as death-offerings, and from edible plants which were set in earthen vessels on the floor of the sepulchre as the furniture of the last resting-place of their beloved ones. Many of these floral remains are so well preserved that after being treated with warm water they can be handled like modern herbarium specimens. The colors, too, are preserved in a remarkable way. The most important matter in connection with these plants is their age. The remains of funeral-food are found in tombs as far back as three thousand years before Christ. Five hundred years later grains of mustard-seed, capsules of flax-seed, gourds, lentils, beans, figs, pine-needles, juniper-berries and other edibles are found. The richest acquisitions in leaves and flowers to the herbarium were made from the tombs constructed between the eighteenth and eleventh centuries B. C. Among the flowers chiefly employed in floral decorations for the dead were the blue and white Lotus, the red Poppy, the Oriental Hollyhock, Crown Chrysanthemum, Safflower, Pomegranate-flowers, Willow-leaves, Grasses and Peppermint. Celery-leaves came into requisition later, and onions, leeks and garlic played an important part in the offerings to the dead. One of the general conclusions drawn from this herbarium is that Egypt has sustained no appreciable climatic changes during the last four thousand years.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLES:—The Western Shad-bush. (With figure.)	409
Water-towers in Massachusetts	410
Civilizing Power of Floriculture	T. H. Hoskins, M.D. 410
The Lakeside Pleasure-ground at Wakefield, Massachusetts,	Sylvester Baxter. 411
Late Summer Flowers on the Prairie	E. J. Hill. 412
NEW OR LITTLE-KNOWN PLANTS:—Cypripedium Chamberlainianum. (With figure.)	412
New Orchids	R. A. Rolfe. 412
FOREIGN CORRESPONDENCE:—London Letter	W. Watson. 413
CULTURAL DEPARTMENT:—Some New Pears	Professor George C. Butz. 414
The Wild Garden in August.—II	M. Barker. 415
Some Little-known Annuals	B. M. 416
Senecio Japonicus	O. O. 416
Begonia fulgens, Primula obconica grandiflora, Aster Candelabra,	J. N. G. 416
Deforestation in Russia	417
CORRESPONDENCE:—The Violet Disease	Professor C. S. Plumb. 417
Plants at Dongan Hills	G. 418
A Pretty Native Vine	Lora S. La Mance. 418
The Way-side Flowers	E. S. S. 419
RECENT PUBLICATIONS	419
NOTES	419
ILLUSTRATIONS:—Cypripedium Chamberlainianum, Fig. 68.	413
The Shad-bush (Amelanchier alnifolia) in Washington, Fig. 69	415

The Western Shad-bush.

THE genus *Amelanchier* is a natural one, closely related botanically to *Cratægus*, from which it differs in its long, strap-shaped petals and principally in the nature of the ovary, which is usually five-celled, each cell being incompletely separated into two chambers by the development from the back of a partial or false division, so that the fruit, which is a little fleshy pome or apple, appears to be ten-celled, each cell containing a seed with a cartilaginous chestnut-brown mucilaginous coat. Frequently, however, there are only five seeds in the fruit, owing to the abortion of one of the two ovules which the ovary contained in each of the original five cells. To its juicy flesh and thin-shelled seeds is due the superiority of the fruit of *Amelanchier* to that of *Cratægus*, in which the flesh is dry and mealy, and the stones, which make up a large part of the fruit, are large and thick-walled. In fact, the fruit of the Thorns is barely edible, and, unless the stones are removed, very indigestible.

Amelanchier has not been differentiated into a large number of species, as is the case with many of the genera of the Rose family, to which it belongs, and only five or six species with a number of varieties are distinguished, all of them bearing such a close resemblance to each other that it is not always easy to recognize them or to find stable characters by which to distinguish them. The genus is widely and quite generally distributed, however, through the north temperate zone; it occurs in the northern and temperate parts of eastern and the mountain-region of western North America, in Japan and central China, in Asia Minor, the Caucasus, southern Europe and northern Africa, but is not found in the great mountain-region of central and southern Asia, to which it might naturally have extended. Europe possesses one small shrubby species, which abounds also in north Africa and in Anatolia; a second species inhabits the Orient, and a third is widely

distributed in central China and in Japan. This is the *Amelanchier Asiatica*, which such careful observers as Miquel and Maximowicz considered merely a variety of the arborescent Shad-bush of eastern North America, where there are two species. These are *Amelanchier Canadensis*, with several well-marked varieties, and the beautiful *Amelanchier oligocarpa*, a shrub of the extreme north, which, as a garden-plant, is one of the most desirable of all early-flowering North American shrubs.

In the year 1804 a party of United States soldiers, under the leadership of Captains Lewis and Clark, commenced the first overland journey from the shores of the Atlantic to those of the Pacific Ocean; on the waters of the upper Missouri River they were able to eke out their scanty diet with the large and delicious Service-berries, which they found in great profusion along their route. This was the fruit of the western Shad-bush, or Service-tree (*Amelanchier alnifolia*), which first appears in literature in the history of this famous and important expedition. The specific character of the plant, which was confounded with the species of the eastern states, was not recognized in these early days, and although it was introduced from Oregon into English gardens by David Douglas in 1826, it was not until some years later that Thomas Nuttall, who had found it in the northern Rocky Mountains, gave the western Shad-bush the rather inappropriate name still used to designate it.

Amelanchier alnifolia is usually a low shrub with spreading stems only a few feet high; sometimes it sends up from the ground a cluster of tall thin stems, or occasionally, under exceptionally favorable conditions, it forms a slender tree thirty to forty feet in height, with one straight trunk eight to ten inches in diameter.

In different parts of the country *Amelanchier alnifolia* varies in a striking manner in the size and color of the leaves and in the amount and color of the pubescence which covers their under-surface while young as well as the shoots. These are generally oval to nearly circular in outline, rounded or rarely acute at the apex, rounded or slightly heart-shaped at the base, and coarsely toothed above the middle; usually they are dark green and membranaceous or slightly coriaceous, although in the dry interior parts of the continent they are much thicker and gray-green on the two surfaces. The leaves vary from an inch to an inch and a half in length and breadth; they are rather inconspicuously veined, and are borne on short slender stalks. The flowers, like those of all the *Amelanchiers*, are produced in short erect racemes, and are smaller than those of the Shad-bush of the eastern states, the pure white petals varying from a quarter to an inch in length. The fruit ripens in different parts of the country from June to September; it is subglobose, from a half to nearly an inch in diameter, dark blue, or sometimes nearly black, covered with a beautiful glaucous bloom, and very sweet and juicy.

The western Shad-bush grows over an immense territory; at the north it is found in the valley of the Yukon River in latitude 62° 45'; it extends south over nearly all the mountain-ranges of western America, ranging eastward to Colorado and Nebraska and through the Saskatchewan and Manitoba to the western shores of Lake Superior and to the northern peninsula of Michigan, where forms occur which are not always easy to distinguish from varieties of the eastern *Amelanchier Canadensis*.

In the interior of the continent *Amelanchier alnifolia* is confined to high elevations, sometimes ascending to 10,000 feet above the level of the ocean, where it occurs near the borders of alpine meadows or covers dry hill-sides with thickets not infrequently hundreds of acres in extent. It is in the valley of the lower Columbia River in rich bottom-land often inundated, or on the small prairies which are common in Washington near the shores of Puget Sound, that the western Shad-bush grows to its greatest size. In such situations it occupies the ground to the exclusion of other shrubs, or is associated with the Oregon Crab-apple, the Hawthorn and the Choke-cherry in dense masses about the margins of the forests of larger trees.

The fruit of the western Shad-bush, like that of all the plants of the genus, is sweet and of excellent quality, as many travelers through the western wilds of North America can bear testimony. Many a party of half-starved explorers and prospectors have been kept alive by Service-berries, which have been always an important source of food-supply to the Indians of the west, who visit every year the localities where the plants are abundant, and gather the fruit for winter use, first crushing it, and then, having dried it spread out on stones or bark, packing it in sacks.

As a plant with which to decorate our gardens *Amelanchier alnifolia* is less desirable than the larger-flowered and larger-growing eastern *Amelanchier Canadensis* and its varieties; it is perfectly hardy, however, and, like all *Amelanchiers*, is easily raised from seed, the seedlings displaying considerable variation in the size and quality of their fruit.

A figure of the flowers and fruit of the western Shad-bush was published in an early number of this journal (vol. i., p. 185). The illustration in the present issue gives an idea of the habit of the plant as it grows under the conditions which most favor its development. It is from a photograph of a cluster of plants growing in gravelly and rather dry soil on a prairie, near Seattle, in Washington, for which we are indebted to Mr. C. V. Piper, of that city.

Water-towers in Massachusetts.

IN another column, Mr. Sylvester Baxter, describing the pleasure-grounds of Wakefield, Massachusetts, alludes to the great architectural beauty of the distant water-tower at Reading, a view of which can be had from the pleasure-grounds at Wakefield.

These water-towers are becoming marked features of the Massachusetts landscape. Every town of any considerable population has its water-works, and as the sources whence water may be drawn by gravity are exhausted, water-towers, or "stand-pipes," have become a necessity. They mark the hill-tops of eastern Massachusetts in every direction and form notable landmarks, but, with very few exceptions, they are not as beautiful as they are conspicuous. They are usually plain cylinders of iron thrust up into the air like enormous steam-boilers, much elongated and set on end, or like very thick, unsharpened lead-pencils, and they disfigure the landscape as a heavy, black perpendicular mark would deface a fine painting. Perhaps there is none more conspicuously ugly than that of Swampscott, the obtrusive presence of which must be very irritating to the summer residents along that beautiful and fashionable shore. Various other suburban communities offend in a hardly less degree. Malden, for instance, has a particularly bad one, unique in these parts, serving both as a tank and stand-pipe, and looking like a gas-holder, perched upon the summit of Wait's Mount, a fine rocky hill rising boldly out of the heart of the city. The offense is the more aggravating because several acres of the top of this hill have been reserved as a pleasure-ground. It is much to the credit of Boston that care has been taken to give architectural character to the several water-towers erected upon prominent elevations in various quarters of the city, the slender, white, minaret-like structure in Roxbury taking precedence in grace and beauty.

All persons of good taste and public spirit should unite in urging upon the local authorities the importance of true proportion, at least, in these structures; something which might be obtained at little or no additional expense. We condemn the Romans for their prosaic utilitarianism, as reflected in their public works. But their aqueducts and bridges had, at least, the merit of a simple grandeur, dignity and true proportion, while, in this age of iron, our useful constructions are apt to be obtrusively ugly.

It would be a wise reform to combine the monumental with the useful in our public works. It is now the exception when either our monuments or our structures of utility are constructed in accordance with sound architectural

principles. There are very few out of the thousands of "Soldiers," or "Soldiers and Sailors" monuments that have been erected since the civil war, which, in after years, a cultivated taste will not condemn. The useful and the monumental have, in many instances, been united with gratifying results in memorial halls, libraries, etc., and this custom is happily growing. One of the best forms of a memorial is a public pleasure-ground, and this idea is also obtaining popularity in many directions. There are also a few instances of memorial bridges—a most admirable form of monument.

If, however, either a community, or a beneficent individual, desires to erect an architectural monument, what better basis for such a structure could be found than that of a water-tower? Towers, pure and simple, have little use nowadays, and their erection in connection with public buildings is usually a waste of money which might otherwise be applied to much better advantage. But a water-tower is, in many commodities, an indispensable object. It could be either united with a public building, or it might stand apart in the midst of a public square, like an Italian campanile, or, erected upon a neighboring hill-top—in a park for instance—it would serve as a fine lookout point as well. In erecting monuments, merely as such, the lack of means adequate to the purpose is apt to give them a bare or scrumpy look. A water-tower must, of necessity, have ample proportions, and this fact would assure dignity and impressiveness if it were made the motive for a monument. Those communities which have monuments to erect would therefore do well to expend the money at their disposal for the purpose either to build a monumental water-tower, or, if they already have the misfortune to possess one of the ugly bare cylindrical monstrosities, to turn the fact to account by enclosing it with a suitably designed exterior of masonry—either of stone or brick, according to their means—embellished with suitable decorative work in the way of carving, sculpture and inscriptions. A monument of extraordinary beauty, either simple or elaborate in its decorative features, might thus be obtained, and its place in the esteem of the public, together with the honor accorded to the individual thus commemorated, would be heightened by the fact that the structure was of constant service in distributing throughout the community one of the most indispensable of life-giving elements—the blessing of pure and abundant water.

Civilizing Power of Floriculture.

THE "flower mission" reaches further and is more widespread in its effects than many comprehend. Nothing interests me more than to note the flowers in the windows of the houses of our working-people. Many of the women of such families are able to achieve real wonders in the culture of house and door-yard plants. They will very likely mispronounce—even ludicrously mispronounce—their names, but they surely have both common and artistic sense in manipulating them—more, I often think, than is displayed by many professional florists. What these unconscious artists know is gained by experience and neighborly consultation. It is all practical in the fullest sense of the word, and yet it all seems, and in most cases I am convinced that it is, filled with a very real æstheticism.

These people, though so fond of plant-culture, and no doubt strongly enjoying its successful results, are very generous. They enjoy quite as much the appreciation of their pets by others as they do the progress of their daily work in caring for their window-gardens or small yard borders. There is never a church meeting, fair or Sunday-school celebration to which they do not freely contribute of their floral stores; and in a long experience as a judge at city and rural flower-shows, I have never noted the existence of a keener appreciation of intelligent opinion upon the comparative merits of choice specimens of cut flowers or pot-plants.

Since the advent of the Tuberous Begonias, and the great awakening of interest in Cactus-culture, these village and suburban window-gardens have taken on a new interest for me. It is a constant pleasure to observe the houses as I pass, in winter and summer alike, and to notice the entrance of one

novelty after another. I live near a "junction village," where many mechanics and train-hands have their houses, and I am very sure that the men of these families keep their eyes open to the advent, in the cities whither they daily ply, of new plants, odd or beautiful, and secure specimens whenever the price is within their means. So far as I can learn, very few of these lovers of flowers buy through the mails or obtain their stock directly from commercial gardens or greenhouses. They are all expert at "rooting slips," and know whence to take them without disfiguring the stock-plant. With Begonias they quite understand leaf-propagation, and are expert in a rude way in the composition of potting-earth. The window-pots are protected from the sun, and by sedulous care unevenness of growth is obviated. But I notice that when one of these flower-loving families becomes able to build a cottage of its own, a corner bay-window is pretty sure to be provided for in its plan.

This love of flowers, of which I have been writing, seems to have something communal in its nature or origin, and does not in any notable degree extend far into the country round about. Only a few farmers' wives seem to care much for, or have any remarkable skill in, window or open-air floriculture. The truth probably is, not that they do not like flowers, but that they have much less time to attend to them. As for out-of-door flower-gardens, loose cattle, pigs, dogs and fowls make such a thing a matter of too strenuous policing to be practicable. Indeed, these dangers greatly limit and discourage the establishment of good kitchen-gardens, which are quite rare on the farms of interior New England.

I happen to know, however, of a flower-garden, the existence and success of which witnesses to the triumph which attends upon stubborn perseverance. It is the work of a farmer's wife and dairywoman who has her hands full of work and whose butter brings the top of the market. Her husband's farm borders on a cross-road with a narrow and not much-frequented track. Like all other roads, however, it is laid out three rods wide, leaving a broad grassy or weedy border. Fences on farms are now a thing of the past in the section referred to, except for the enclosure of pastures; and the road-sides are either cultivated or grassed to the edge of the wheel-track. In many places, at this time of the year, one may ride considerable distances along roads where the hubs of the wheels must brush the oats, rye or other grain in turning out to pass another vehicle. One of these road-sides close by an old homestead had thus been brought under cultivation in Potatoes, and a strip near the buildings was taken by the farmer's wife for a "posy garden." I have seen her working in it a long summer evening until it had become too dark to note the time by a watch. It is about one rod wide and five or six rods long, and I think it would puzzle any one to name any common flowering plant in cultivation that is not to be found there. There is not much apparent order or system in this garden, but it has become so famous that many driving out from the village go out of the way to visit it; and this indefatigable woman is deriving quite a neat income from the plants and flowers which she is called upon to supply for by-passers. She says it pays her much better than the dairy, which is the principal object of her daily care. It certainly confirms the truth of the adage, that "where there is a will, there is a way."

Newport, Vt.

T. H. Hoskins.

The Lakeside Pleasure-ground at Wakefield, Massachusetts.

WHEN casually discussing the relation of the various lakes in the Boston metropolitan district to the question of public pleasure-grounds, in my account of a bicycle trip to the Waverley Oaks, I alluded to Lake Quannapowit, in the town of Wakefield, as one of the few examples of anything like an adequate dealing with the opportunity presented. That it has been done so satisfactorily in this case is mainly owing, I believe, to the public spirit of a wealthy citizen and to the fortunate location of an important county highway. The town of Wakefield, formerly South Reading, was named in honor of the late Cyrus Wakefield, the founder of the leading industry of the place—the manufacture of rattan goods. Mr. Wakefield did much to improve the town, then it adopted his name. He gave it a large and costly town-hall, and was chiefly instrumental in laying out and improving one of the most charming pieces of public ground possessed by a town of its size, numbering 6,982 inhabitants by the census of 1890.

The main county highway from Boston to Lowell, by way of Malden bridge, becomes in Wakefield, as in most of the places through which it passes, the main street of the town,

the most populous part of which is pleasantly situated between two lakes, something like a mile apart; Crystal Lake, the smaller of these, lies to the southward of the village against a pleasant range of rocky and wooded hills. It presents a charming appearance from both the Boston and Maine Railroad and the main highway; the railway runs between the lake and the street, which is considerably above the water-level and commands some beautiful glimpses between the intervening houses—a fact which it would be well to take advantage of by providing an open space from which a view of the water might always be obtained. A most attractive feature of this lake is a pretty little rocky islet, covered with trees.

Lake Quannapowit lies at the other end of the village, and the common is designed with reference to this fact. As it approaches the lake, Main Street broadens considerably and gives opportunity for the beginning of the public ground, which takes the shape of a large triangle with its base on the lake-shore. The first section is a wedge-shaped piece of ground containing a few hundred square feet. This is walled about with rough rock about eighteen inches high, I should say, entirely mantled with a luxuriant growth of Japanese Ampelopsis. At the broad end, toward the lake, is a large rock-rimmed basin, screened on the north by a high, irregular-shaped wall of rough rock, rising to a height of perhaps four or five yards. At the centre of this wall is a handsome Elm. A rich and tangled growth of Bittersweet clammers over the wall and up into the tree, thus uniting it with the structure of a fountain, which, rising from the basin, sends a fine spray over the adjacent grass and foliage, keeping it a rich full green. The only questionable feature about this delightful bit of ground is the formal flower-bed which occupies the centre of the raised grass-plot within the triangle with some garish Geraniums and foliage-plants—altogether too artificial in appearance for the unconventional character of the design. A group of flowering shrubbery would be better.

Beyond the road which cuts off this triangle from the continuation of the public ground is the old-fashioned New England Common, here a large grassy space widening out toward the lake, tree-shaded, and bordered by a low fence of simple design. This piece of ground could, in its simple dignity, hardly be improved. The common, again, is separated from the grounds bordering the lake by a street, upon which, facing the town and cornering upon the lakeside grounds, is a large and handsome new church of gray stone—a feature that greatly helps the scene with its picturesquely rich and stately architectural element.

The grounds on the lake slope gently down from the street to the shore. Very appropriately this area is simply a broad stretch of lawn, with no trees to interrupt the view of the water, to which it thus carries the eye by the pleasing transition of a broad sweep of greensward. Fortunately, the town has had the good sense and good taste to remove a very ugly brick fire-engine house that, until recently, stood here. An ornate music-pavilion is now the only structure upon the grounds; it offers no obstruction to the view, which it only serves to accent.

This attractive scene gives Wakefield its most distinctive character. The lake, thus cherished and beautified, plays an unusually important part in the life of the place. There is bathing in its waters; boating, canoeing and sailing on its surface in the summer; skating and ice-boating in the winter, besides band concerts, promenading and driving on its shores.

The view up the lake deserves rank among the notable park scenes in the country. There is a vista of something like two miles of sparkling blue water to the northward, with a shore-line just irregular enough to prevent monotony, but without diminishing the effect of largeness—the water-area showing for the full value of its length and breadth. White-sailed yachts skim like swallows over the surface, and row-boats and canoes glide gracefully about.

Beyond the end of the lake, on the upland to the left, cluster the roofs and spires of Reading, the parent town of Wakefield, and, seemingly from the midst of the place, rises a great water-tower of a decided architectural character. In the distance, from across the water, its high and massive shaft with a finely proportioned roof, tapering like that of a mediæval turret, say at Nuremberg, is most impressive, and dominates the surrounding edifices of the town with something of the grace and majesty of a great cathedral tower in an Old World city.

The main street, or county road, on its way northward to Reading, turns to the right and follows the easterly shore of the lake. Between the street and the water the lawn-like character of the grounds continues for some distance, giving to the margin of the water a refined touch in keeping with its surroundings. There is, however, too great a uniformity in

this smooth expanse of lawn extending along the shore. The central space should, of course, be kept smooth and broad, and as it is, the plain simplicity of the whole is vastly preferable to the tawdry fussiness of floral bedding effects. Here, however, by the massing of varieties of flowering shrubbery on both the right and left of the lakeside section, and on the strip between the road and the water, a pleasing effect could be produced something after that of the Fenside, on the Back Bay Fens. The expense of caring for so much lawn would also be saved. In carrying out a work of this sort it would be well, of course, to obtain the advice of a landscape-architect.

A number of pleasant-looking places, including several simple, old-fashioned-looking houses with ample grounds, stand on the street bordering the lake. On the water-side of the road there are one or two boat-houses, and a little boat-landing is seen now and then. As the road continues it loses its suburban character and becomes distinctively rural; the strip of ground between the highway and the water is diminished to a few feet. There is a good fringe of trees and wild shrubbery along the margin. It is said to be the intention to widen the street gradually and, by filling in, make a broader strip of ground along the water-side. If this should be done it would be well to retain the wild shrubbery, emphasizing, however, its present character by planting all the native species natural to such a habitat.

It would also be well to secure the westerly margin of the lake, so far as possible. On that side, at a point near the town, there is a cemetery with its white marble gravestones and monuments gleaming under the trees—less offensive than most places of the kind. Looking back toward the town the view at that end of the lake is picturesquely attractive, with the fine expanse of public grounds and the handsome great stone church. At that end is the principal landing-place, and a little fleet of sail-boats lies moored off shore. A huge ice-house, with its galleries painted dark brown, stands near by, and is not an unpleasing example of utilitarian construction. Along the westerly shore, here and there, are other great ice-houses like barracks; some of them are brilliantly whitewashed and are altogether too prominent.

The road, in its course beside the lake, commands a succession of fine views over the water. Near the northern end of the lake a pretty brook comes gurgling out through a thicket, the modest beginning of the Saugus River. Beyond is a little beach by the roadside, with a watering-place for horses and cattle.

I must note a pretty effect that caught my eye at a railway crossing on my way home by bicycle. The county highway runs very near the Boston and Maine Railroad. At a crossing near the southerly limits of the town of Wakefield I was struck by the very graceful effect of a growth of Virginia Creeper clambering over the sentry-box-like little house for the flagman, and thence up the tall post bearing the usual sign of "Look out for the engine while the bell rings!" converting it into a really beautiful feature by the simple sweep of the carelessly drooping sprays of foliage. Such effects are very common at railway crossings in Germany, but are rare enough in this country, and especially on the Boston and Maine Railroad.

Boston.

Sylvester Baxter.

Late Summer Flowers on the Prairie.

THOUGH many species of *Allium* are cultivated for food, some have found a place in the flower-garden. A wild species common on the prairies may be classed with the ornamental kinds, especially when seen in masses. In late summer the Nodding Wild Onion (*Allium cernuum*) decks many fields with showy flowers. The triangular scape, a foot or two high, curves abruptly near the top, and carries a roundish umbel of thirty to fifty flowers in a nodding position, which has given it both its common and botanical name. They are mostly rose-colored, but pink and white kinds are numerous. This imparts to a field a variegated appearance, bright on the whole, since the reddish hues prevail. They are often in such quantities and grow so thickly that little else is noticeable where they stand. They are not easily exterminated, and maintain their place where most of the native plants have disappeared, still flourishing on the commons or in vacant lots in the more thinly peopled sections of the city and in the suburbs. They are common in pastures where the feet of cattle have crushed out the life of less stubborn plants, or where the prairie grass has been replaced by cultivated kinds. In some localities they have evidently increased under such treatment, and taken the place of those which have yielded. Their bulbous root serves them admirably in this respect, and bears much rough treatment before its vitality is destroyed.

Sometimes the Spiked *Liatris* (*L. spicata*) shares the ground with it, or is seen apart in other masses quite as extensive. In either case it forms a striking picture. With a long cylindrical spike of rose-purple flowers lifted a foot or two above the *Allium*, the combined effect of the two when growing together is very fine. Nearer the ground are seen the lighter-colored, roundish flower-clusters of the *Allium*, while over them stand the brighter, wand-like clusters of the *Liatris*. Though the leaves of the *Liatris* are very numerous, they are not long enough near the upper portion of the stem to seriously hide the flowers of its humbler companion, but being close and very narrow often furnish them with a fringe-like setting. The *Liatris* also has a thick, solid root or corm, and retains its hold quite well upon its native soil, though disappearing sooner than the Wild Onion from fields where the indigenous grasses have been supplanted by foreign species.

Another showy plant of a different habit, *Hibiscus Moscheutos*, the Swamp Rose Mallow, is in bloom at this season, and lasts till September. Though common in brackish marshes by the sea, it is much less familiar to those dwelling at a distance from tide-water. It is found in the swamps and by shallow ponds near the southern end of Lake Michigan. The rose-colored flowers, expanding five or six inches, exceed in size any flowers here except the Water-lily and the Yellow Nelumbo. The branching stems are from four to eight feet high, and are abundantly provided with handsome dark green leaves, which are soft and velvety. The large buds are as attractive as the flowers, excelling them in one respect, since the flowers are of short duration, while the buds are prominent for several days. In this region the Rose Mallow does not usually grow in water, but on sandy and muddy shores, which are overflowed in the wet season. It does well by the drier borders of the ponds, and remains in localities somewhat remote from them, where the swampy lands have been drained. It may be found interspersed with *Cornel*-bushes, or with a background of low trees and climbing vines. It readily takes to cultivation, and is a fine ornament for the garden.

Englewood, Chicago.

E. J. Hill.

New or Little-known Plants.

Cypripedium Chamberlainianum.

THIS new *Cypripedium*, which was the occasion of considerable comment among Orchid-growers when it was first announced for sale early in the present year, was imported from New Guinea by Messrs. F. Sander & Co. It is a beautiful species, besides being so distinct that it was described originally as belonging to a totally new section, and it really has few characters in common with *C. Rothschildianum* and *C. Stonei*, although it is classified in the same group with them. The plant has been described in former numbers of GARDEN AND FOREST, and our present purpose is merely to invite attention to the illustration (see page 413) from a photograph kindly sent us by Mr. Robert M. Grey of a specimen which flowered something more than a month ago for the first time in America, so far as we are aware, in the collection of H. Graves, Esq., Orange, New Jersey. The species is robust and very floriferous, and native specimens are said to produce from twelve to twenty flowers. The plant from which our illustration was taken was weak, but it produced six flowers. The dorsal sepal is primrose-yellow, veined and speckled with vinous brown. The petals are much twisted and of the same color. The lip is much inflated, a bright rose-purple and primrose about the opening and base. Altogether, *C. Chamberlainianum* seems to justify all the enthusiasm which its introduction kindled.

New Orchids.

DISA INCARNATA, Lindl.—After being known for upward of half a century, this Madagascar species has at last been introduced to cultivation, and flowered with Messrs. W. L. Lewis & Co., of Southgate. The flowers are of a bright cinnabar-orange, except the dorsal sepal, which is deep yellow, with bright red spots.—*Gardeners' Chronicle*, May 14th, pp. 618, 619, fig. 88.

PHALENOPSIS × *AMPHITRITE*, Kranzlin.—A pretty hybrid raised between *P. Stuartiana* and *P. Sanderiana*, the latter being the pollen parent. It bears a considerable re-

semblance to *P. Sanderiana*, modified in the direction of the other parent. It is not stated where it originated.—*Gardeners' Chronicle*, May 14th, p. 618.

CÆLOGYNE CUPREA, Kranzlin.—A species allied to *C. speciosa*, Lindl., but with smaller glabrous flowers, which are copper-colored. It flowered with Monsieur Wendland at Herrenhausen from plants imported by Messrs. F. Sander & Co., of St. Albans.—*Gardeners' Chronicle*, May 14th, p. 619.

ONCIDIUM GRAVESIANUM, Rolfe.—An elegant *Oncidium* allied to *O. crispum* and *O. prætextum*, but with much narrower petals, which impart a very distinctive appearance to the plant. It bears large branching panicles of golden yellow and brown flowers two inches in diameter. It was imported from Pernambuco by Messrs. F. Sander & Co., of St. Albans, and received an award of merit from the Royal Horticultural Society on April 19th last.—*Gardeners' Chronicle*, May 21st, pp. 650, 651, fig. 94.

CYPRIPEDIUM × EVENOR, Hort.—A hybrid raised from *C. Argus* crossed with the pollen of *C. bellatulum*, with foliage much like the former, and a flower resembling that of *C. × Marshallianum*. It was exhibited by Messrs. James Veitch & Sons, of Chelsea, at a meeting of the Royal Horticultural Society on May 17th last, and received an award of merit.—*Gardeners' Chronicle*, May 21st, p. 664.

CYPRIPEDIUM × EURYLCHUS, Hort.—A hybrid raised from *C. ciliolare* crossed with the pollen of *C. hirsutissimum*. The petals are elongated and deflected, rose at the tips, greenish at the base, spotted with purple, the upper sepal and lip being greenish, shaded and spotted with purple. It was exhibited by Messrs. James Veitch & Sons at a meeting of the Royal Horticultural Society on May 17th last.—*Gardeners' Chronicle*, May 21st, p. 664.

DENDROBIUM × NESTOR, O'Brien.—A hybrid raised from *D. Parishii* crossed with the pollen of *D. superbum*, and somewhat like a smaller edition of the latter. The flowers are three inches in diameter, the sepals and petals white, tinged with rosy lilac, and the lip with a large rosy purple blotch on either side. It was raised in the collection of C. Winn, Esq., of Birmingham.—*Gardeners' Chronicle*, June 4th, p. 718.

LISSOCHILUS GRÆFEI, Kranzlin.—A species allied to *L. streptopetalus*, Lindl., with an erect raceme of flowers, the sepals green, suffused with purple-brown, the petals pale yellow outside, brighter in front, and the lip pale yellow, with violet-colored side lobes. It flowered in the stove of Dr. Hugo Græfe, of Berlin.—*Gardeners' Chronicle*, June 11th, p. 749.

MASDEVALLIA × CASSIOPE, Hort.—A charming little hybrid raised from *M. triangularis* crossed with the pollen of *M. Harryana*. It is like an enlarged and improved form of the former, with the reflexed dorsal sepal and a considerable share of the brilliant coloration of the latter. It was

raised in the collection of Captain Hincks, of Thirsk, Yorkshire.—*Gardeners' Chronicle*, June 11th, p. 749.

CYPRIPEDIUM × CHRYSOCOMES, Hort.—A hybrid said to have been obtained by crossing *C. cordatum roseum* and *C. × conchiferum*. The flowers are very large, and light yellowish green, with some brown spots on the side lobes of the lip. It flowered in the collection of R. H. Measures, Esq., of Streatham.—*Gardeners' Chronicle*, June 18th, p. 781.

Kew.

R. A. Rolfe.

Foreign Correspondence.

London Letter.

FUCHSIAS.—An interesting lecture on Garden Fuchsias was read last week at the meeting of the Royal Horticultural Society by Mr. George Fry, the veteran raiser of many of the best varieties, and a well-known cultivator of them for the last sixty years. The early history of the Fuchsia as a garden-plant is now well known, how it was introduced a century ago

(1788) to London from Chili by a sailor, who gave it to his mother, who grew it in her cottage window at Limehouse, where it attracted the attention of a passer-by, and ultimately was purchased by the Messrs. Lee, of Hammersmith, the Veitchs of that period, for £80. Messrs. Lee's plant was named *F. coccinea*, by Aiton. Numerous seedlings were raised from it, and variety thus obtained, but it was not until the introduction in 1830 of a second species, namely, *F. fulgens*, that hybrids were possible. In 1855, Messrs. Henderson, of St. John's Wood, distributed the first of the varieties with white corollas, raised by a Mr. Storrey, of Newton Abbot, who unfortunately died soon afterward, without recording the origin of this new break. More recently, other species have been blended with the varieties previously raised, and there are now numerous distinct kinds, one might say hundreds,



Fig. 68.—*Cypripedium Chamberlainianum*.—See page 412.

many of them of exceeding beauty.

It is difficult to account for the want of popularity of the Fuchsia in England at the present time. There are certainly few gardens in which the genus is not represented, but one scarcely ever meets with a collection of Fuchsias as we do of Chrysanthemums, Pelargoniums, etc. And yet, no plants are more easily managed, none more elegant or more beautiful when well grown and flowered. I have a vase of the blooms before me as I write, a few shoots a foot long, thickly clothed with drooping crimson and white flowers, which have been in the room a week and are still fresh. It would be difficult to find any flowers better suited for vases than Fuchsias. They are not good nurserymen's plants, as they are so brittle that they pack badly, and the flowers are easily shaken off. Still, in the greenhouse, in the border, or even as wall-plants in the open air, they must always rank among the most decora-

tive of summer-flowering plants. In the conservatory at Kew, Fuchsias are grown as climbers; they are planted in a border below the side stages, and the stems are trained up and below the rafters of the roof, from whence the profusely flowered shoots hang in great abundance and have a very pretty effect. In the Temperate House the Fuchsias are trained to tall stakes twelve feet high, and in the summer they form narrow pyramids of bloom. Of course, the hardy kinds are also employed for summer bedding, a purpose for which when used with a little judgment and combined with suitable companions they are exceptionally well adapted.

Mr. Fry has grown perfect pyramidal specimens of the best kinds as high as fourteen feet. He recommends the sowing of the seeds, which are produced abundantly, much more than is at present practiced, as with ordinary care the plants will bloom when only six months old, and while all, or nearly all, the seedlings will be worth growing, variety, and probably some of superior quality, may be in this way secured. The arrangement of the stamens and pistil in the flowers of Fuchsia renders their cross-fertilization easy. There are a considerable number of species of Fuchsia which, in the hands of the skillful hybridizer, would probably yield good results in the shape of new varieties. Such species are *F. triphylla*, *F. decumbens*, *F. syringæflora* and *F. dependens*, none of which, so far as I know, have been bred from.

The cultural details given by Mr. Fry were pretty much the same as are known to all who have grown Fuchsias. He recommends shade for the plants when grown under glass, plenty of ventilation, plenty of water in the growing season, and a range of temperature from fifty to seventy-five degrees.

Mr. Fry's ambition had been to raise a Fuchsia with pure white flowers, but in this he has been forestalled by Messrs. Cocker, of Aberdeen, who raised a few years ago Countess of Aberdeen, which is almost wholly pure white, and is a very beautiful variety. There is a good collection of garden Fuchsias in the gardens of the Royal Horticultural Society at Chiswick, and at Kew there are altogether thirty-six true species under cultivation.

NEW PLANTS.—The following obtained certificates at the last meeting of the Royal Horticultural Society:

Lælia-Cattleya Ingramii, raised by Mr. Bond, gardener to Mr. C. L. Ingram, of Godalming, by crossing *L. Dayana* with *Cattleya aurea*. The plant, though small, was of promising appearance, and the flowers showed distinct traces of the characters of both parents, the *Cattleya* being most evident in the labellum, which was large and colored deep crimson; the sepals and petals were colored rose. *Cypripedium caudatum*, Luxembourg var. This was sent by Monsieur Godefroy-Lebeuf, of Paris. It is a very superb variety of a very handsome species, the flowers being large, with broad sepals, long tails, and the color a deeper shade of yellow than in the type, the markings of the labellum, etc., being as usual in this species. *Calanthe Sanderiana*, from the St. Albans nurseries, is a new species of considerable interest lately introduced from New Guinea. It belongs to the evergreen section of the genus, and resembles *C. veratrifolia* in habit, but the flowers are larger, with a peculiarly thick spur, and the color is mauve on the sepals and petals, crimson-maroon on the labellum. *Lælia Oweniana*, also from Messrs. F. Sander & Co., is a hybrid between *L. Dayana* and *L. xantheria*, in which the flowers are like those of the first-named parent, the sepals and petals white, the lip deep maroon in front, with a yellow blotch in the throat and a white disk-like area on the middle of the front lobe.

Sarracenia Farnhami, a hybrid between *S. Drummondii* and *S. rubra*, is another pretty addition to the cultivated varieties of Side-saddle plants. It has medium-sized erect pitchers, green in the lower half, crimson toward the apex, and prettily tessellated with greenish white and spotted. It was exhibited by the raiser, Mr. Farnham, of Loughborough.

The following Carnations were submitted to the committee as new, and obtained certificates: The Moucher (yellow), Old Coin (light brown, yellow and crimson), Salamander (rose), King of Scarlets (a very handsome full-flowered glowing red variety), Acme (yellow, with rose flakes), Duchess of Sutherland (Picotee, white, with rose margins), Nellie Bath (Picotee, yellow, with deep crimson edges), Mrs. A. Barrett (Picotee, yellow, heavily edged with rose). These were exhibited by Messrs. C. Turner & Sons, Slough, who have long held a foremost position among the raisers and cultivators of Carnations.

Mr. Rivers, of Sawbridgeworth, showed his new cherry, Emperor Francis, which was awarded a first-class certificate on account of the great size and rich flavor of its bright red fruits. At the previous meeting Mr. Rivers exhibited a collection of his best varieties of cherries, peaches, apricots and plums, which had been grown in his famous orchard-houses, and which astonished those who had not seen to how large a size these fruits can be grown under glass in England. He also obtained a certificate for a new plum named Late Transparent Gage, and which is remarkable for firmness of flesh, lusciousness and lateness, ripening at the end of August.

Buddleia Colvillei.—Mr. Gumbleton, of Cork, has been the first to flower this beautiful Himalayan shrub, specimens of the flowers having lately been forwarded by him to Kew. There is also a figure prepared from a specimen from the same source in the *Gardeners' Chronicle* this week. B. Colvillei was named and described by Hooker in his *Illustrations of Himalayan Plants*, published in 1855. He found it on the Sikkim Himalaya at an elevation of from 9,000 to 12,000 feet, where it forms a large shrub fifteen or twenty feet high, with lanceolate-crenate leaves six inches long, and large erect terminal panicles of crimson campanulate flowers an inch across. It is hardy in Mr. Gumbleton's garden, which is, however, favorably situated. From the altitude at which the plant is found it would, however, be safe to infer that it will prove as hardy in England as some of the Sikkim Rhododendrons which are found at the same altitude and are hardy here. I believe B. Colvillei will prove to be a good garden-shrub.

London.

W. Watson.

Cultural Department.

Some New Pears.

SOME new Pears are fruiting here, the first time this season, and notes upon them will be more interesting now than when the season is past. Some varieties prove themselves worthless in our region with their first fruits, while others are equally pronounced in the opposite direction. I find the greatest differences of opinion among individuals upon the quality and value of different pears. The Kieffer Pear is condemned as emphatically as it is praised throughout Pennsylvania, yet the points in its favor are so eminently good that it will win in its fight for a place in our orchards. As a market pear and for canning, I have only the warmest praise for the Kieffer as I know it here.

These notes on Pears were prompted by a very remarkable fact concerning the Lawson Pear. From stout, healthy trees, six years from planting, the first crop of fruit was set and ripened this summer. A more beautiful lot of pears was never seen, but not one out of the whole yield of two pecks contained seeds! The core was very much contracted and spongy. This seems to be a feature of the variety, as there is nothing abnormal to cause it temporarily. The trees are in the best state of health, and all the fruits are as near perfection as a summer pear can be. The Lawson deserves considerable attention as it is a very good early pear. The fruit is above medium size, broadly pyriform; skin, waxen lemon-yellow, with many green and brown dots, richly colored with bright crimson or red in the sun. The stalk is of medium thickness and length inserted at one side at an inclination, with a lip of flesh above and a depression on the under side; the calyx is partly closed in an open, even basin. The flesh is white, not very juicy, slightly granular, with a somewhat sweet, highly perfumed flavor, without seeds; it ripens from August 1st to August 20th. This pear will not keep very long after ripening as it softens at the core; this softening is most sudden in fruit

left too long on the trees. The fruit should be picked fully ten days before ripening. The points that will recommend this pear most strongly are size, color, firmness and fragrance.

To find if the seedless nature of this pear was known, I wrote to Wm. Parry, of New Jersey, who offers this variety. In reply he wrote: "A number of trees have fruited this summer and created a very good impression. We had not noticed that they were seedless, and cannot say whether ours were so or not, as our crop is now all gone."

The Early Harvest is another new Pear, ripening a week later than the Lawson. If it gives no better results elsewhere than it has given here, it would be better to abandon it at once. This is described in Parry's catalogue as "very firm, can be shaken from the tree like walnuts, packed and shipped to the market, ripening on the way and coloring up handsomely." All of which is quite true, but disappointment follows. The fruit is very firm even when fully ripe, so much so that the flesh is tough, and in all the fruits that passed under my observation the centres were soft through decay, and the taint of rottenness affected the entire fruit before even the color of ripeness appeared. Whether picked green or ripe,

four feet high, the lower portion furnished with dark green ovate-lanceolate leaves, terminating in large flowers, the purplish disks of which are prominent and cone-like—hence the popular name—and the drooping rose-purple rays about two inches long. It likes a good free soil, in which it makes vigorous growth, and is easily increased from seeds or by division of the plants.

Some of the Horse-mints, Monardas, notably *M. didyma*, commonly called Bee Balm, or Oswego Tea, and *M. fistulosa*, otherwise known as Wild Bergamot, are usually full of flowers at this time of the year, lasting, indeed, well into September; but, owing to a lack of moisture in July, our plants are not as fine as we have had them in past seasons. The good qualities of the plants, however, are still sufficiently manifest to elicit a word of commendation. They are fragrant perennials, from three to four feet high, and of erect habit. The flowers are borne in whorls at the extremity of the stem, and they are of an intense scarlet color in *M. didyma*, while those of *M. fistulosa* are light purple. There are a few other species, but those mentioned are the best of the group. Both plants make satisfactory progress in ordinary soil, but, if possible, they should be sheltered from the direct rays of the sun.



Fig. 69.—The Shad-bush (*Amelanchier alnifolia*) in Washington.—See page 409.

the interior behavior was the same. The quality of the pear in flavor and substance is very inferior.

Other varieties ripening later yielded their first fair setting of fruit in 1891, and show a good crop again this year. These are the Cocklin, Garber and Mikado, all of them of Sand Pear parentage; ripe in October and November. It is not probable that any of these will ever be considered fine for dessert, because of a certain coarseness combined with a lack of sweetness. They are all three to be classed with *Le Conte* in quality, and therefore not suited to the north.

State College, Pa.

Geo. C. Butz.

The Wild Garden in August.—II.

THE Purple Cone-flower (*Echinacea purpurea*) is very distinct and beautiful. Ample testimony of its attractiveness may be found in the fact that it was the second plant selected by the conductors of the *Botanical Magazine* for illustration in their great work. Although thus prominently brought to public notice so many years ago, it is still comparatively rare in cultivation; but it remains, nevertheless, one of the best plants of its class to be found in garden catalogues. The stems are about

There is no prettier sight in the garden at the present time than that afforded by a clump of the Flowering Spurge, *Euphorbia corollata*, growing strongly on the steep bank of a shallow pond. But this plant is very deceptive in a botanical sense, for what at a first glance seems to be the flower is only a series of bracts arranged around the real flower in the form of a calyx or corolla. The simple stem ascends to a height of about three feet, and is well clad with pale green, oblong leaves. The bracts are pure white, each cluster of five having the appearance of a spreading flower one-fourth of an inch in diameter, and these floral appendages are borne in immense numbers at the top of the stem, the inflorescence taking the form of a compound whorled umbel.

The Cardinal-flower, *Lobelia cardinalis*, is more at home on the lower ground hard by, where its erect racemes of glowing scarlet flowers have been a dazzling feature of the place for several weeks past, and where they will continue a brilliant attraction for some time to come. The blue flowers of *L. siphilitica*, the Great Lobelia, are quite as beautiful as those of its red-flowered relative, though not so lustrous. The plants resemble each other closely in habit and requirements, but *L. siphilitica* blooms later, the earliest flowers appearing

about the first week of August. There are white-flowered forms of these two species, which, while interesting as varieties, are not nearly so decorative as their original types. These *Lobelias* grow best in moist soil, and they may be quickly propagated by any of the methods commonly pursued in the case of herbaceous perennials.

Liatrix spicata is almost over, its career having been considerably shortened by the dry, hot weather. It is from two to three feet high, the numerous stems a trifle stiff. The habit is neat and compact, and the showy purplish flowers are freely disposed on the upper portion of each stem. This plant is most effective when grown in large patches, and it delights in free exposure to sunshine, and in soil of good quality. The same may be said of the Wild Senna, *Cassia Marilandica*, a most excellent plant, which flowered all through July and is still in full bloom. The stems of this *Cassia* are three or four feet high, erect, though slender, bearing alternate, pinnate leaves, and short axillary racemes of nearly regular, golden yellow flowers, the anthers of which are quite black, adding much to their beauty. The racemes are generally densely clustered at the stem, and the plant is best propagated from seeds.

The long racemes of purple Pea-shaped flowers produced by *Desmodium Canadense* are quite pretty, but the plant is large and spreads rapidly, requiring a great deal of space for its full development. Not so with the Missouri Evening Primrose (*Enothera Missouriensis*), which has been producing its enormous yellow flowers with great freedom since the latter part of June. It is seldom more than a foot high, the stems having a tendency to spread by courting the ground.

The various kinds of *Coreopsis* (Tickseed) make a lively show of color, chiefly bright yellows and rich browns. The plants vary in height from one to four feet, and the taller sorts require the support of stakes. *C. lanceolata*, *C. grandiflora* and *C. tinctoria* are the best species. The latter is an annual, but its self-sown seeds afford a generous supply of plants. *Centaurea Americana* is another desirable annual. It is about three feet high, the stems bearing handsome purple flowers, four inches in diameter, at the summit. The plants should be raised under cover in spring, and transferred to the open any time after the middle of June. *Eupatorium purpureum*, with reddish purple flowers, and *E. perfoliatum*, in which the inflorescence is whitish, are blooming profusely. They form ornamental groups from three to five feet high.

Cambridge, Mass.

M. Barker.

Some Little-known Annuals.

THE annual *Cupheas* are best represented by *C. lanceolata* and *C. silenoides*, plants of considerable merit, though not often to be seen outside of botanical gardens. They are worthy of a more extended use. The stems of each are from twelve to eighteen inches high, and bear large quantities of flowers during July, August and September. Those of *C. lanceolata* have two large, rich purple segments behind, and four smaller ones of paler color in front. The flowers of *C. silenoides* are very similar, except that all the divisions, large and small, are of the same dark purple color, the larger ones having margins of a lighter shade. Both plants are natives of Mexico, and they would probably repay some efforts in the way of hybridizing.

Emilia sagittata, better known as *Cacalia coccinea*, has been too much neglected. It belongs to the natural order *Compositæ*, and was introduced from the West Indies in 1799. The plant is of erect growth, about two feet high, and the stems and branches terminate with from three to six flower-heads of bright orange-scarlet color, and about half an inch in diameter. It blooms freely throughout the summer, and is most effective in masses.

The intense blue flowers of *Delphinium consolida*, borne in racemes from six to nine inches long, are very charming, and even in the driest season the plants bloom with surprising persistence. The stems are about two feet high, and fairly well branched toward the top. The leaves are deep green, and, being finely divided, give the plant a beautiful feathery appearance. *D. consolida* occurs freely in Europe, and was at one time highly esteemed in gardens abroad. The improved forms of perennial *Delphiniums* which have been produced in recent years were so detrimental to its popularity, however, that it is now rarely seen in cultivation; but it is slowly regaining its former position. There are many varieties, single, double and semi-double, in which the colors range through various shades and mixtures of blue, pink and white.

Trachymene cœrulea, sometimes called *Didiscus cœruleus*,

is a free-branching plant about eighteen inches or two feet high. The leaves are not imposing, but the compact, somewhat convex umbels of small, pale blue flowers are extremely pretty, and about three inches across. It is a native of New Holland, and was introduced in 1827.

Silene Armeria is a common European weed, but very decorative in our gardens notwithstanding. It is of erect habit, about eighteen inches high, branching profusely. The opposite, glaucous leaves are very smooth, of ovate-lanceolate outline, and rather pleasing to the eye. The large corymbose inflorescence is composed of showy pink blossoms, which are half an inch in diameter and produced in great abundance. *S. Armeria alba* is an excellent white-flowered variety, though hardly so ornamental as the species. The two plants are deserving of a place in every garden, and it is perhaps worthy of remark that both are said to spread rapidly in this country from self-sown seeds.

Sanvitalia procumbens is a desirable little gem, scarcely more than six inches high. The numerous stems are thickly clad with small ovate leaves, which form a close green ground for the dainty Daisy-like flowers an inch in diameter. The disk is dark purple in color, the ray florets rich golden-yellow and so formed that the entire circle appears to be regularly notched.

With the exception of the *Silenes*, which appear to give the greatest amount of satisfaction in slightly elevated portions of the rockery, all the plants here mentioned thrive best in the ordinary soil of garden-beds and borders. The seeds should be sown in spring, and placed in a greenhouse or frame where the heat is sufficiently great to exclude frost. The seedlings may be potted singly when large enough to handle easily, and finally planted outside when there is no further dread of cold weather.

Newton, Mass.

B. M.

Senecio Japonicus.—Besides hardy plants for border use there is now a large demand for suitable sub-tropical plants as a setting or background for aquatics. Many of these are only half-hardy, requiring to be replanted every year, a process which takes both time and money; consequently, all plants of this character which are hardy, love moisture and have a beauty of their own are worthy of notice.

The giant Groundsel of Japan, *Senecio Japonicus*, called in some catalogues *Erythrochæte palmatifida*, is not as well known as it deserves, though it has been in cultivation in the United States for ten years or more. It is, without doubt, hardy, and will thrive in any moist garden-soil. This *Senecio* is one of the handsomest of the genus, the plant being tall, five feet high, with large, much-divided leaves, each about a foot across, on long stalks from the root. The flower-stems are stout, sometimes much-branched, with large orange-yellow flowers three inches across, much like those of *Silphium* or single Sunflower, except that they flower in June. Our plants have flowered profusely this summer and are now maturing seed, few of which, however, have power to germinate. When given a proper place, with room to develop its roots within reach of plenty of moisture, *S. Japonicus* will prove very ornamental, either alone or associated with other plants. It starts very early in spring, and late frosts, which kill the *Polygonums*, *Astilbes* and other succulent shoots, have never in our experience injured this *Senecio* in the least.

South Lancaster, Mass.

O. O.

Begonia fulgens is a tuberous Bolivian species said to have been discovered in the same locality as *B. Baumannii*, and, like that species, it is especially interesting for its fragrance. *B. fulgens* proves to be a plant of dwarf growth with moderate-sized leaves, which above are of a deep emerald-green, with deep veinings of a lighter green, short abundant hairs and a satiny lustre. Underneath, the leaves have strong veins and are stained a vinous red. The leaf-stalks are short, and from these rise numerous pink flower-scapes to a height of, say, twelve inches. These each bear three or four very handsome pure carmine flowers, single, of good substance and five-petaled. The female flowers are in great preponderance. They are fragrant, but not so pronounced in odor as *B. Baumannii*. The scapes are slightly curved, and the flowers are pendulous. Owing to this habit this plant will not probably meet with much favor with the hybridizers, as the present fashion in *Begonias* is for rigid flowering-stems, holding the flower face up. But it is a beautiful variety, which will be welcomed by the fanciers of this species, among which are so many very interesting and beautiful plants. At the suggestion of Messieurs Lemoine, who introduced *B. fulgens* in the fall of 1891, one of the plants has been grown in the border in full

exposure to the sun. But this condition does not seem as favorable as the protection of a cool greenhouse, where the tuberous Begonias generally find their most satisfactory quarters in an average season in this latitude. Growers who have had much experience with this section of Begonias must be convinced that the plants require certain conditions for their welfare, and sometimes need careful attention, which can best be supplied in this climate of sudden changes when the plants have a certain measure of protection and are under some control.

Primula obconica grandiflora is the tempting name under which a French nurseryman offered, this season, the seed of a new *Primula*, said to be a hybrid between *P. obconica* and *P. cortusoides*. The claim made for this strain was that the flowers were not only larger, but that they had a wider range of color than in the *Obconica* type. A large lot of these plants, which are young, but very vigorous, fail to show much mixture of foreign blood with *P. obconica*. Among the plants are a limited number which show larger flowers than the type, say, an inch in diameter, and these somewhat in the way of *P. cortusoides*. The colors have about the usual range of mauves. Evidently the strain needs selection, but it is apparent that the best of the seedlings are an improvement on this valuable flower. A good admixture of *P. cortusoides* blood with *P. obconica* would apparently be a great gain, as it would probably give a touch of grace to the flowers, and might possibly produce a race which would be fairly hardy, and a hardy *Primula* of the free-flowering character of *P. obconica* would be a great gain. Out-of-doors the peculiar irritating quality of the leaves would not be so great a drawback to its culture. The strain under notice has these qualities rather more highly developed than in any seedlings previously grown by me, rendering them almost impossible plants to be grown in close quarters by any one who has a sensitive cuticle.

Aster Candelabra seems to be the most distinct new *Aster* of the year, and apparently worth cultivating. Usually *Aster* novelties vary only from the old types in coloring, with occasionally a slight change in form, the latest of which were the beautiful Comets introduced a few years since. This strain varies principally in the habit of the plant, it being much branched at the base with long stems in the way of a candelabra, whence it is happily named. Either for bedding or for cutting, this habit renders it well worth growing, as the plant is less compact than the usual type, and produces not only a less heavy effect, but furnishes more long-stemmed flowers. They are to be had in white, rose and violet, and are with reflexed petals. *Asters* in this locality are devastated by a large black beetle with an appetite many times larger than himself, and it is only by constant attention and almost hourly hand-picking that one can secure a crop of flowers. These insects are recent arrivals, appearing first some three years ago, before which the *Aster* crop was as much a thing of course as it is now uncertain.

Elizabeth, N. J.

J. N. G.

Deforestation in Russia.

THE following article appeared in a recent number of the *Literary Digest*. It was translated from the *Preussische Jahrbücher* for July.

When treating of the Russian famine of 1891-92 in the April number of this magazine, we remarked that this was not to be regarded as a passing incident, but rather as the inauguration of a chronic condition of affairs traceable to unsystematic farming, to the general withdrawal of capital from the land for investment in manufacturing enterprise, under the ægis of a protective tariff, and to the general deforestation of the country, in great part to provide fuel for railroads and protected enterprises. The fatal consequences of this general deforestation are now generally appreciated, the shrunken state of the once noble rivers of the country, and growing aridity of the climate, affording evidence that can neither be overlooked nor gainsaid.

The regions of the mighty rivers, the Don, the Volga and the Dneiper, the great arteries of Russia, were formerly fringed with wide-spreading forests, along their whole upper and middle courses, which sheltered their sources and tributaries from evaporation throughout the year. These forests have now for the most part disappeared. Mile after mile the traveler sees nothing but low scrubs and melancholy stumps in unbroken succession; the "Mother Volga" grows yearly shallower; the steamers find scarcely seven or eight feet of water in mid-stream; and the ferries pursue their snake-like course from bank to bank in search of the ever-shifting channel. The Don, with its tributaries, is choked; the sources of the

Dneiper creep downward, and its chief tributary, the once noble Worskla, with a flow of some 220 English miles, is now dry from source to mouth.

The city of Poltawa lies on its banks, and it was at its mouth that the Swedish army surrendered to Peter the Great. This stream, which fertilized a broad region, supporting a numerous population, exists no more—not temporarily run dry, but with all its springs exhausted, so that in future it may be stricken from the map. The Bitjug, another river in the Don region, the upper course has wholly disappeared—valley and bed are filled to the banks with sand and earth. As if by magic, wide, fertile lands are buried under the sands, and whole villages desolated. "There has been," says Wiestnik Jewropy, "an unparalleled revolution of natural conditions, which threatens a great part of the country with the heat and aridity of the Central Asian Steppes. The present condition of our black-earth region is so serious, and its future so dangerous, that it cannot possibly escape the serious attention of the Government, the scientist and the husbandman, to whom the further development of the situation is perhaps a question of life and death."

There is perfect unanimity in attributing the threatening catastrophe to the denudation of the forests. Innumerable factories sprang into existence, and, in the absence of any systematic provision for coal-supply, they were erected in the heart of the forest, and, after having consumed all the available fuel within easy distance, their plant was actually sometimes transferred to fresh fields. Thus originated the system of wholesale destruction, which was liberally furthered by the network of railways built to maintain their communication with the great marts of commerce and provide generally for the transport of produce. For the past forty years thousands of locomotives and factories have been run almost wholly with wood without a thought being given to any provision for reproduction. The extension of the railways afforded an opportunity for extracting colossal fortunes from the "worthless" forests. These were the manufacturers' views also; so the fate of the Russian forests was sealed. "The machines have devoured the woods."

The recently passed law for the protection of the forests has come fifteen, twenty, or twenty-five years too late to avert the destruction of the agricultural region.

And the Government and people of Russia had already been warned. Forty-two years ago—that is, shortly after the famine of 1847-49—we find the following in a letter from the Charkowski Government to the Imperial Society of Economics: "There are now living people who remember when the present limitless expanse of sand-waste along the banks of the Dneiper was covered with almost impenetrable forest, interspersed with lakes, which have since dried up or are fast drying up. Our region is flat, deforested, and exposed to all winds. The fatal east wind finds no impediment, and brings ruin in its train. This wind will perhaps at no distant date prove fatal. The Grecian colonies went under probably from the same cause. Protect the forest; sow, plant forests, protect them with rigorous laws. The Volga and Don and all the rivers of southern Russia will be silted up and disappear unless the forests be protected."

More fatal even than the drying up of the streams is the cessation of the spring and summer rains. This is the immediate cause of last year's harvest failure, and on it even depends the current year's harvest. There have been local rains, but not nearly enough. This reversal of old conditions has been coming on gradually with the denudation of the forests; and emphatic warnings, as we have seen, have been uttered. The only result has been the appointment of commissions which have done nothing. Remedial measures on a large scale are now contemplated. Are they too late?

Correspondence.

The Violet Disease.

To the Editor of GARDEN AND FOREST:

Sir,—The article by Mr. Orpelt on Violet disease, on page 381, was of considerable interest to me. In view of the ravages caused by the Violet disease, in a letter written early last spring to the *American Florist*, I specially requested specimens of diseased plants for study at this station. Two shipments were received from a grower in eastern Massachusetts, who supplies the Boston market with Violets, and had in March about five thousand plants in one house. The leaves reached me in good condition, but soon turned brown and wilted away. At times the florist had thought that quite a

share of the disease was caused from the "sling" of the green fly, which did not develop until fall, when heavy dews and warm sunny days occurred. The plants of a neighbor of this Massachusetts grower have also been troubled with Violet disease, but he attributes it to coal-gas. The leaves in the house begin to dry up all around the edges, and finally the whole leaf becomes as dry as a bit of paper, and when a new growth of leaves appears they are affected in the same way. In the specimens of these plants a distinct bacterial disease was found.

We have just received another shipment of plants from Mississippi, from a woman who makes a specialty of growing Violets. The plants sent, she states, were quite healthy one week before shipping, but all at once they looked as if they had been scalded, and in a few hours were in a very badly browned up and wilted condition.

Mr. Orpet states that the Victoria is disease-proof with him, but it is the Victoria that is giving trouble in Mississippi, although Schoenbrunn, Marie Louise, Swanley and a number of other varieties are perfectly healthy.

As the botanical department of this institution is giving attention to certain floricultural problems, among others the diseases of flowering plants, it would be esteemed a special favor if any of the readers of GARDEN AND FOREST having diseased Violets would send them to us by express after September 1st, for investigation here. It will be well to dig a little of the soil around the roots, and send them in as nearly the natural condition as possible. We propose to pursue a systematic study of this malady.

Agricultural Experiment Station, Lafayette, Ind.

C. S. Plumb.

Plants at Dongan Hills.

To the Editor of GARDEN AND FOREST:

Sir,—Since my last visit to Farview, Mr. Wm. Tricker has enlarged and increased his water-tanks, and has several noticeable ones, in which the lover of aquatic plants will find many objects of interest. A large tank of *Nelumbiums*, consisting of young plants of *N. speciosum* and *N. nucifera*, was interesting as showing the difference in growth of the two under the same conditions, the former variety being much more free in flower. These flowers in Japan are said to embrace a wide range of color, and it is to be hoped that among the varieties some may be found which flower more freely than any we yet possess. In another tank was a large selection of the leading varieties of *Nymphæas* grown for seed, and in many cases they had been carefully hybridized. Evidently we shall soon have *Nymphæa* hybrids to meet all demands for these favorite flowers. In this tank, for convenience, the crowns of the plants were placed just under the surface of the water, and the thriftiness of growth gave striking proof of the value of shallow culture. Mr. Tricker had in flower all the *Nymphæas* which have been mentioned in your columns, and I also noted in addition *N. elegans*, a beautiful variety of a medium size, with light blue flowers, apparently borne very freely. Seedlings of *N. Zanzibarensis* had numerous shadings of the typical blue or purple and some very charming forms with roseate hues. *N. Laydekeri*, the new *Nymphæa*, seems to be a wonderful variety in its strange range of colorings. Open on the same plant, at the same time, were flowers, nearly white, faint pink, deep pink and dark rose. Unlike most *Nymphæas*, the flowers seem to deepen in color as they grow old.

At one side Mr. Tricker was making a plantation of ornamental grasses, *Arundos*, *Eulalias*, etc. Among these *Eulalia gracillima univittata* stands first for grace, though many others are of nobler proportions. The Abyssinian grass (*Pennisetum longistylum*) made a striking show with its fluffy heads of bloom. Though an annual, it is one of the most valuable and effective of ornamental grasses of moderate height.

When the American florists make up their minds that certain plants are "good things," they cultivate those plants with great unanimity. They have certainly discovered the value and beauty of Crozy's Cannas, and here, as at most important places, was found a selection in a comprehensive variety. I did not note the names of the best kinds, but among them all Madame Crozy seems to be without a peer for finished elegance. The *Chrysanthemum*, evidently, is becoming a greenhouse-plant, and it must be said that here, as well as at other places, I found the plants under glass rather better than out-of-doors. The competition at the shows is now so close that the growers can no longer afford to take the chances incident to out-of-door cultivation. Nevertheless, the finished products seen in the shows, albeit more pure in color, seem to be lacking in the solidity of bloom found in those grown under more rigorous conditions.

Farview also possesses a private range of glass houses and extensive grounds which are under the able superintendence of Mr. Tricker. Among some elaborate bedding arrangements there was being tried a variety of *Sanchezia nobilis*, a very bright and effective plant. A good crop of peaches in one of the houses came from Hall's Early, which seems a finely colored decorative variety for dessert, but not high-flavored. A lot of Fig-trees were well set with fruit, and the cultivation here seemed a success, as did also that of Grapes—a small house of Sweetwaters and Black Hamburg showing a heavy crop of well-formed and well-colored bunches. In the plant-houses great use is made of *Allamanda Hendersoni*, one vine of which covered many square feet of glass and bore hundreds of beautiful yellow flowers. The scarlet Passion-flower seemed to be another favorite seasonable vine. A lot of the new seedling hybrid *Streptocarpus* were just coming into bloom, and seemed to be interesting plants in leaf and flower. They flower profusely, but one would hesitate to call them handsome, for they lack both the delicacy and the purity of color of other Gesneraceæ. Judging from these seedlings they need careful selection, many of them having blotches and markings of a dull purple, which could only be enjoyed by the color-blind. As they were grown in close proximity to a fine collection of Tydeas, Achimenes and Gloxinias their characteristics were unpleasantly accented. The houses also contain a fine selection of Orchids and foliage-plants, gems among which one inclines to linger, but the description of which is not likely to be of interest. Among the minor features of some of the houses beautifully developed by Mr. Tricker is the decoration under the benches, which is seldom seen so well carried out. Among a groundwork of low-growing trailing plants with variegated foliage were many clumps of fancy leaved *Begonias*, *Marantas*, *Alocasias*, etc., with grasses, while the variegated *Pothos* covered the posts with its close leaves. Such a feature as this is worth imitating in many other houses, where such spaces are often unsightly and detract very much from the appearance of handsome collections.

Elizabeth, N. J.

G.

A Pretty Native Vine.

To the Editor of GARDEN AND FOREST:

Sir,—The idea is prevalent that all variegated foliage is the result of low vitality or of actual disease in the plant. This may be the rule, but a ramble through our south-western woods would prove it to be a rule to which there are many exceptions, for here may be found several species of native plants clothed with prettily marked or mottled leaves, which, nevertheless, are apparently perfectly healthy and vigorous. One of these, *Passiflora lutea*, a small, slender-growing vine, with rather broad, obtusely three-lobed leaves scattered alternately along its stem, bears yellowish green flowers, so small as to be quite inconspicuous, yet worth studying, because of their curious fringed crowns and filamentous processes. Its foliage is decidedly pretty, and the graceful vine, with its clinging tendrils, would, if it were a rare exotic instead of a common native, become a great favorite as a basket-plant. Transplanted from the woodland to the foot of the rockery, these vines adapt themselves admirably to their new position, their delicate growth never quite obscuring the rocks over which they climb, yet softening the angularity of the cold, hard stone by their graceful tracery of leaves and tendrils.

In their own habitat there is a marked difference in the leaf-coloring of different individuals of this species. Perhaps one-third of them have no variegation, the leaves being of a uniform dark green. As Gray, in his manual, makes no mention of any leaf-marking in this species, he probably considers the plain-leaved examples the normal type, but in this section of the country the majority show a more or less distinct variegation, ranging from the plants whose leaves show only a few faint dots or splashes of pale green or ash-gray, to specimens whose leaves are heavily marbled with varying shades of green. In a leaf before me, the groundwork is a deep, even green, blocked with gray-green, light green and pale yellow. This leaf was taken from one of the plants at the rockery, where the soil is rich, and there is an exposure to the sun for a part of each day. They seem to deepen in variegation as they grow older and stronger, though this may be the result of a favorable situation. It is a little strange that none of our wild-flower dealers make mention of this Passion-flower, for it has certainly more merit than some upon their lists, and its range is enormous, extending from southern Pennsylvania to Florida, and west to Missouri and Louisiana.

Pineville, Mo.

Lora S. La Mance.

The Way-side Flowers.

To the Editor of GARDEN AND FOREST:

Sir,—I wish to make a plea for the preservation of way-side flowers. In the state of Connecticut, where wild blooms are in such profusion, the eye is delighted to see on every road-side the beauty of shrubs and vines. Each broken bank, with its adjacent rocks, makes a study for the artist, the pretty green and flowering things offering a picturesque foreground to every landscape. The sweet white Honeysuckle perfumes the air, and Wild Roses in great variety smile on the dusty traveler. The yellow Daisy opens its brown eyes to chide the tardy Golden-rod; the red Lilies flame in the fence-corner, yellow and pink and purple Heather have a home here among the Spiræa, the Cowslip and other natives of the soil. The Pond-lily opens its white disk on the waters, and in wet places the Marsh Mallow shows its spreading cups of delicate pink. The variety is endless, and the generous abundance of nature invites us to accept her gifts, though she does not intend they shall be taken with selfish waste.

But it is not only of these that I wish to speak. There are way-side flowers that, wandering from the garden, are flourishing in sunny spots outside. A group of Coreopsis, a Hollyhock, a plantation of Bluebells or Nasturtium often seek to root themselves or to send their winged seeds into the waste places, and become denizens of the soil. There seems an inherent desire on the part of every traveler to gather these way-side wanderers from the garden. Their rarity attracts the eye; the unexpected association with home-joys awakens the desire of possession, and so every bright flower, which, if left to ripen and scatter its seeds, might gladden the hearts of many in coming years, is quickly plucked from the stem, and after a moment of admiration carelessly thrown aside to make way for some new claimant upon the traveler's attention.

The beauty of the road-side is the property of all who pass, and no one has a right to destroy it. Indeed, the highest sense of obligation should impel each one to do everything in his power for the growth of flower and fruit, for the destruction of insect marauders or poisonous plants, but most of all should he leave untouched the fragile wild things that know so well how to take care of themselves when unmolested. And a deeper chord of human fellowship is struck when one reflects that for the quiet homes along the country-roads this wild beauty is often the only poetry of life, and there are those in humble dwellings and amid poor surroundings who value it and regret its loss.

New Paltz, N. Y.

E. S. S.

Recent Publications.

Le Potager d'un Curieux. By Messieurs Paillieux and D. Bois (second edition, Paris, 1892).

Variety is the great characteristic of man's diet, as it is of man's raiment. Still, to confine our remarks to such articles of food as are derived from the vegetable kingdom only, it is curious to note that the number of fruits and vegetables usually found in the best-stocked market is a mere trifle in comparison with the total produce which might be used as food. Some nations have a much more extensive diet than we have, and a highly competent authority asserts that "one would sooner make a list of vegetable produce left uneaten by Chinamen than enumerate all the articles which they actually eat."

It should not be inferred, however, that no vegetable is worth growing and eating which is not as yet recognized as such in the civilized world. Some plants may want only to be better known or to have some time and care bestowed on their improvement to assume their rightful place in our gardens.

It is to these "unknown, or imperfectly known, vegetables" that Messieurs Paillieux and D. Bois have devoted for the last twenty years a good deal of time and study, collecting, in fact, information sufficient to make up a volume of nearly 600 pages, and of very great interest to botanist, gardener and amateur alike.

The number of vegetables alluded to in this, the second edition of the work, amounts to two hundred. All, of course, are not equally new or equally promising. Some, in fact, may be said to have been known for ages, and to be vanishing away from gardens rather than deserving to be introduced into cultivation. Such are among others: Skirret (*Sium Sisarum*), which seems to be losing ground every year; Cuba Purslane (*Claytonia perfoliata*), the Ice-plant (*Mesembryanthemum crystallinum*), and the Algerian Valerian (*Fedia Cornu-copizæ*).

A good many, again, are plants well known and even largely grown for some other purpose, either economic or or-

namental, which may be used as vegetables on an emergency, but of which no one would think as vegetables only. In this class we may include *Aponogeton distachyon*, *Camassia esculenta* (the Quamash of the western territories of North America), *Amorphophallus Rivieri*, *Lilium auratum*, *L. speciosum* and *L. tigrinum* of Japan, *Momordica Charantia*, *Nelumbium speciosum* (the Lotus of Egypt and India), *Oxalis Deppei*, and *Portulaca grandiflora*, which are very beautiful ornamental plants, but all of them very poor vegetables indeed.

Among the most promising of the plants introduced in the *Potager d'un Curieux* three are especially worthy of notice, namely, *Arctium Lappa*, var. *Japonicum*, *Soja hispida* and *Stachys affinis*.

Arctium Lappa, var. *Japonicum*, described also as *Lappa major*, is simply a variety of the cosmopolitan "Burr." The fleshy root of the plant grows and swells rapidly in deeply trenched soil; so much so that it can be obtained one inch thick in the space of three months, and yields a vegetable resembling salsify or scorzonera, but of quicker growth, very white and tender, and easily made very palatable by proper cooking.

Soja hispida is a Chinese plant of the order Leguminosæ, which is remarkable for the large proportion of fat and of nitrogenous matter contained in its seeds. It is from the *Soja* that the Chinese and Japanese manufacture the "vegetable cheese," a highly nutritious paste which can hardly be recognized from cheese made of milk, and the "Shoyou," a condiment of every-day use, which appears to enter largely in the composition of many of the patent "sauces" made in England.

Soja is not very delicate as a fresh vegetable, as the seed, which is the eatable part of the plant, has a very thick and hard skin. But it might be removed before dishing up. The plant is so prolific, so perfectly hardy and disease-resisting, that it would be worth while to devote some time and care to its improvement. Most varieties of the *Soja* ripen their seeds too late to be of much use in northern Europe, but several of them might be grown easily in North America.

Stachys affinis, otherwise *S. tuberifera*, first introduced to notice by Monsieur Paillieux, can be said to have attained in Europe the position of a standing vegetable. In France it is fast becoming popular as *Stachys*, or "Crosnes du Japon," and it is recognized in England as the "Chinese Artichoke." It is a perfectly hardy vegetable, consisting of the fleshy, pearl-white, underground stems of *S. affinis*. The tubers, although very watery to all appearance and easily crushed between the thumb and fingers, contain a rather high proportion of albuminous and gummy substances, and therefore constitute a not altogether despicable food. The tubers intended for propagation should be kept in sand over winter, planted out in rows or on mounds early in spring and left to themselves, with the exception of occasional weeding all through the season. The tubers are not wholly formed till the vines die off. They will stand any amount of frost if left in the ground, and they are all the more delicate for being pulled up just before cooking.

A good deal of attention is paid by the authors to such plants, or parts of plants, as are well adapted for being pickled in vinegar, so as to introduce some variety in the "pickles," too commonly made exclusively of gherkins, small onions and bits of cauliflower. The West India Gherkin (*Cucumis Anguria*), the tuberous *Nasturtium* (*Tropæolum tuberosum*), the *Martynia*, the Chinese Artichoke, and last, not least, the *Mioga*, the unexpanded flower of a sort of Ginger (*Amomum Mioga*), are specially recommended for pickling.

Many interesting points in this book are necessarily left untouched here, but enough has been said to show that it is a very curious work, stored with quaint facts and suggestive information. It contains the results of many years of careful study and of protracted experiment, and all references to other books or periodicals are most accurately given, by which the utility of the whole is doubled. The authors, too, have done their work in an evidently enthusiastic but entirely disinterested spirit, and in perfect good faith, plainly stating the pro and con in every case. This in itself is no small merit.

Notes.

The beautiful Royal Gardens at Laeken, near Brussels, with their magnificent conservatories, are frequently thrown open freely to the public, and recently 26,460 persons visited them during a single day.

Seven acres of Apricot-orchard in Tulare County, bringing their owner a return of \$2,100, and eight acres of Prune-orchard in San Bernardino County, yielding twenty-five tons of fruit,

which brought \$50 a ton, or more than \$150 per acre, are mentioned in this year's early reports upon the California fruit-crop.

The *Tombstone Epitaph* recently spoke of a garden near Yuma, Arizona, in which are growing twenty-five Date-palms, the largest of which is thirty feet in height and fifteen years old. This and five of the other trees are now in bearing, and some of the bunches of their fruit weigh fifty pounds, and are estimated to contain three thousand dates each.

Much attention was attracted among the visiting florists at the recent convention in Washington, District of Columbia, by the fine specimens of Crape Myrtle (*Lagerstrœmia*) to be seen in that vicinity. Chief among these was a magnificent plant in the old garden at Mount Vernon, the specimen in question being eighteen feet high, as many in diameter, and covered with large trusses of its lovely pink blossoms.

A correspondent of the *Journal of Horticulture* complains that *Salvia patens* is not met with as frequently as it once was. This seems to be true for this country also, and yet in late summer and early autumn we know of no plant whose flowers are of so pure and true a blue. It does not produce flowers so abundantly as does the Scarlet Sage, but it is quite as striking in its way among blue flowers as is *Salvia splendens* among scarlet ones.

At the recent meeting of the American Association for the Advancement of Science, in Rochester, it was resolved, in accordance with the advice of the Committee on Forestry, that such legislation as is contemplated by the bill introduced and reported by Senator Paddock (S. 3,235), which provides for the preservation and practical administration of the public timber domain, deserves commendation; and it was resolved further, that copies of the resolution be sent to the President, the presiding officer of the Senate, and the Speaker of the House of Representatives.

Over 250,000 pounds of beet-sugar have been produced at the Chino factory, in San Bernardino, California, from this year's crop, showing an enormous growth of this industry in the state. Four hundred thousand acres of Beets were planted against 2,700 acres last year. The growers have netted \$4.50 a ton, and one man, who bought twenty acres of land and raised fifteen tons to the acre, paid for this land with the first beet-crop. Since a bounty was placed on beet-sugar, the farmers of California have been quick to see the profit in this industry.

Two very fine pans of the Brazilian *Hippeastrum reticulatum* are in bloom in the greenhouse of H. H. Hunnewell. There are twenty scapes in one and seventeen in the other, averaging five flowers to a scape. This species is nearly evergreen, and is handsome even when out of bloom. The leaves are a very dark green, sharply recurving, with a white stripe down the centre of each leaf. The flowers are borne on stout scapes a foot or more high, about four inches in diameter; segments, unequal, spreading and recurving; color, soft pink, with a deeper-colored reticulation running through the flower, from whence comes its specific name.

The *Horticulteur châlonnais*, for the benefit of those who may desire to preserve blossoming flowers fresh for several days, says that this end may be obtained by snipping off the tops of their pistils and thus preventing fructification, which hastens the withering of the flower. But it likewise gives a less well-known receipt, which is, that a small incision made in the pedicel of the flower, or near by in the branchlet which bears it, causing the flower to bend a little to one side, will retard development by partially stopping the flow of sap. If this operation is performed just before a bud unfolds, it will open much more slowly and yet lose nothing of its beauty or perfume.

From a recent bulletin from the Florida Experiment Station it seems that while the weight of an orange steadily decreases after it is picked, the specific gravity increases for a while and then falls off—that is, for a period after plucking, the orange becomes more and more compact and afterward it “loosens up,” so to speak. The specific gravity of a freshly pulled orange is generally less than unity. It increases for a while, as the drying goes on, and then decreases, the maximum often exceeding unity—that is, an orange which at first would rise in water will after a few days or a week sink and afterward rise again. In making up the scale for honors and medals, weight counts ten points. In view of this fact, it would be manifestly unfair to compare the weights of oranges that have been pulled from trees different lengths of time.

The practice of enclosing grape-clusters and other fruits in bags of paper or of thin woven tissue as a protection against insects and fungi is perhaps more common in some parts of Europe than it is in this country. A contributor to a Belgian horticultural journal recommends, as particularly well adapted for this service, bags of transparent oiled paper such as is used by draughtsmen for making tracings. “The transparency of this paper,” he says, “permits the fruits to profit by solar light and heat. Grapes, Peaches and Apricots trained on espaliers in the open air find in them something of the atmosphere of the hot-house. Inside a hot-house they are equally useful, for, being impermeable, they permit that spraying of the vines or trees with insecticides which is now usually abandoned as the fruit begins to develop. And the bloom of fruits grown in these receptacles is exquisitely preserved.”

In a recent bulletin from the Cornell Experiment Station on the comparative merits of steam and hot water for greenhouse heating, it is stated that a comparative test conducted there led to the conclusion that under the conditions at the station steam was more economical than hot water, and more satisfactory in every way. While not condemning hot water, Professor Bailey, under whose charge the experiment was made, adds that, in his belief, steam is superior for very large houses where the fall is slight, for most forcing-houses and for all establishments which are likely to be often modified and extended. Steam overcomes obstacles such as elbows, angles and obstructions better than hot water, and it travels faster and farther. It can be varied more quickly than hot water, and yet under proper management it is quite as steady, and requires no more attention. For conservatory purposes, for straight runs and small houses steam is equaled, and possibly, in some instances, surpassed by hot water. In forcing establishments where hot water is used it is most satisfactory when conducted in wrought-iron or gas pipes in essentially the same manner as steam.

Many persons have been enquiring of late why there has been so much delay with regard to the establishment of those small parks in the poorer districts of New York which were provided for by a law passed in 1887. Perhaps there has in some cases been more delay than was absolutely needful; but few people realize how slow are the processes by which city property, in the hands of a great number of owners, can be transferred by condemnation proceedings to the guardianship of the city. The sites for several new small parks were long ago decided upon, and the Commissioners of Estimate and Apportionment have been busily at work in the matter, but have not yet brought it to a conclusion. These proposed pleasure-grounds include Mulberry Bend Park, to create which the notorious crooked street of rookeries will be swept away; a park near St. John's Church; and Corlear's Hook Park, near the East River. But even sooner than for these we may look for Rutgers Park, at Rutgers Slip, and the extension of East River Park. The land in these two cases already belongs to the city; plans for both parks have been considered by the Park Commissioners; \$23,000 has recently been appropriated for Rutgers Park, and the work there as well as at East River Park will be begun as soon as the contractors can get to work.

In the Boston *Transcript* the Listener describes a garden which is full of interest as showing how a love of growing things and care for their welfare can find expression in the most sordid surroundings. This little garden, not more than fifteen feet in length by twelve in width, is to be found in Boston in a half-slum street largely inhabited by colored people. It contains in one corner a large Mock Orange, and in the opposite corner another similar shrub. Along one side of the area are many plants of Violets and Lilies-of-the-valley, all in a thrifty condition, while pretty bunches of Oxalis in bloom nestle in all the corners. Along the other side of the area is a row of tall Ascension Lilies, now out of bloom, of course, but telling a story of past magnificence. Massed together in the centre are many fine potted plants in flower. All the space is utilized, and there are several plants and creeping vines whose names the Listener did not know. To crown all, a splendid specimen of *Ampelopsis Veitchii* ascends the house-wall, spreading right and left over the long brick block, and covering the fronts of the adjoining houses, where it has intertwined itself within the slats of the shutters so that they can never more be closed. It is in such service as this that the luxuriant climber which the Japanese have lent us finds its perfect work, covering and cooling the hot walls of humble dwellings and bringing something of color and brightness into the dull monotonous lives of the toiling poor.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLES:—The Boston Metropolitan Park Commission.....	421
The Botanical Garden of Dublin.....	422
Overland in the Cayuga Country.—II.....	Professor L. H. Bailey. 423
Notes on the Flora of Smythe County, Virginia.—IV.....	Anna Murray Vail. 424
NEW OR LITTLE-KNOWN PLANTS:—Smilax glauca. (With figure.).....	424
ENTOMOLOGICAL:—Notes on Two Troublesome Borers.....	F. G. Jack. 426
FOREIGN CORRESPONDENCE:—The Rock-garden at Kew. (With figure.)	W. Watson. 426
CULTURAL DEPARTMENT:—Summer Greenhouse Climbers.....	M. Barker. 428
Roses.....	W. H. Taplin. 429
Iris Lorteti.....	Professor M. Foster. 429
Onions at the North Carolina Experiment Station.....	Professor W. F. Massey. 430
Torenia Fournieri, Tom Thumb Dahlias.....	G. 430
CORRESPONDENCE:—Some New California Plants.....	Carl Purdy. 430
Spiræa Aruncus.....	Lora S. Le Mance. 431
RECENT PUBLICATIONS.....	431
NOTES.....	431
ILLUSTRATIONS:—Smilax glauca, Fig. 70.....	425
The Rock-garden at Kew, Fig. 71.....	427

The Boston Metropolitan Park Commission.

THE Metropolitan Park Commission, which has lately been organized for the area known as Greater Boston, marks an important step in the progress of the park movement in the great cities of this country. The Commission is one of investigation, appointed by the Governor, to inquire into the needs of the cities and towns in the vicinity of Boston, and to report to the Legislature in 1893 a plan for the provision of ample open spaces in the territory under consideration. The limits of the territory are not defined, and the scope of the investigations in this respect, as in others, is left to the discretion of the commissioners. The establishment of this Commission is an outcome of the organization of the Trustees of Public Reservations, and a direct result of the conference of Park Commissioners and others interested in the subject called by the Trustees last autumn, and held at the office of the Boston Park Commission, an account of which was given in GARDEN AND FOREST (vol. v., page 62). That such a commission has already been authorized is a sufficient indication of the rapid growth of public sentiment in favor of public recreation-grounds. Fortunately, the members of this Commission are admirably qualified for their work. They are all well known, not only as men of broad public spirit, but they have been generously and intelligently active in many worthy projects for establishing and maintaining public parks and for preserving for public use places which have a special value from patriotic association or intrinsic beauty.

It is probable that the scope of the inquiry undertaken by this Commission will be sufficiently broad and thorough to enable the city to deal intelligently with all the important park problems which now confront it. Among the features of the investigation ought to be the reservation of large woodland and hilly areas like the Middlesex Fells and the Blue Hills; of points of marked picturesque, historic or traditional interest like the "Appleton Pulpit,"

in Saugus, with its neighboring lake-scenery, and the Waverley Oaks in Waltham; of the various lakes or ponds in the metropolitan region; of the margins of the rivers and streams, including the beautiful expanses of salt-marsh bordering their tidal estuaries; of spaces by the sea-shore sufficient to permit water-side recreation; of the reforestation of the islands in Boston harbor; and, finally, a study should be made of the important question of sufficient playground and breathing-spaces throughout all the territory in the suburbs of the city.

A population of something like a million inhabitants is included within the territory which will probably be covered by the investigations of the Commission. There are many passages of strikingly beautiful scenery within this area, but the population is increasing so rapidly that every year sees lamentable encroachments upon some of the most charming landscape passages. There is now an opportunity to deal comprehensively with the subject, and to secure the permanent reservation of precious natural features which many another city with a liberal and far-seeing policy in regard to park matters would have regarded as of priceless value had they existed in its neighborhood. Indeed, Chicago has gone to the trouble of creating, at great cost, landscape-effects which at best are quite inferior to many a scene already existing in the neighborhood of Boston and only need to be preserved.

Fortunately, the public mind is becoming alive to the importance of definite action in the near future, and if the Commission reports a plan covering the ground most thoroughly it looks as if the power of popular sentiment might effect its adoption. Already in a considerable number of the separate communities interested steps have lately been taken looking toward the acquisition and improvement of public grounds, and local park commissions have been appointed. But small communities are apt to deal with such matters solely in relation to their own locality; and they can hardly be expected to treat them as parts of some general system, especially if no such system has been planned. Besides, in places growing as rapidly as the Boston suburbs are growing, there are always matters demanding immediate attention and large outlays, such as sewers and sidewalks to construct, roads to improve, school-houses to build, water-works to extend, and these take precedence of works of an "ornamental" character, as parks and playgrounds are too apt to be regarded. Where park improvements have been taken in hand in these places the methods employed and the results achieved have usually presented an unfavorable contrast to the comprehensive way in which the great central municipality has dealt with the subject, both artistically and practically. It therefore seems desirable that the entire metropolitan region should be treated as a unit in the planning of a system of parks and other open spaces.

Altogether, the formation of this Commission seems to us an event of more than local significance. There are many American cities which are expanding as rapidly as Boston is, and which are in immediate need of provision for future parks. The report of this Commission ought to be an important contribution to the literature of the subject, and it will have a special value if it carefully considers the machinery and methods of administering a system of city parks after they are once established.

In his article, entitled "The Tilden Trust Library: What shall it be?" published in *Scribner's Magazine* for September, Mr. John Bigelow declares that, as regards this question, "the press of New York has a manifest duty, for it is only through the press that the best judgment of her citizens can be evolved, and the public authorities properly encouraged and sustained in giving that judgment fit and adequate support." In the performance of this duty we feel impelled to say that our views differ from those of Mr. Bigelow as regards the proper location for this library.

Mr. Bigelow believes that, if the reservoir on Fifth Avenue can be dispensed with, the library should be erected on the open site which will then embrace the whole area bounded by Fifth and Sixth avenues and by Fortieth and Forty-second streets, and called Bryant Park. The pictures which accompany his article give a pleasing idea of the aspect this square would present with a large library in the centre and four small gardens in the corners, which the cruciform plan of the proposed building would leave vacant. And he is quite right when he says that the situation is so central, and access to it so convenient, that "no site better adapted for a structure of suitable proportions for a metropolitan library could be carved out of any part of the city than this of Bryant Park." But the suitability of the site for a worthy purpose is not the only thing to be considered. We must weigh what we should gain against what we should lose. A single spacious park covering all this site might be of greater advantage to the city than a library and four little parks, and no one needs to be told that playgrounds for children and breathing-places for adults are of the first importance to the well-being of a large city; or that New York, below Fifty-ninth Street, is deplorably poor in such open spaces.

Mr. Bigelow is careful to point out that, if the library is planned according to the pictures he shows, the four gardens for which it will leave room will be larger, in the aggregate, than the space now actually occupied by Bryant Park, as the reservoir now covers a little more than one-half of the area that is called by this name. But four little isolated gardens, each enclosed on two sides by the walls of the library, would be of much less value than a single wide open space almost equal to them in extent. Fresh air, free winds, an open outlook, long vistas beneath umbrageous trees, considerable lawns where the eye can find refreshment, and extended walks where children can play—these are now to be had in Bryant Park; and a visit to it on any pleasant afternoon will prove how thankfully its opportunities are enjoyed by hundreds of poor people from the teeming streets which lie to the westward. Can any one think that their needs would be as well served by four gardens, each about one-fourth the size of this park? Furthermore, it takes a generation for trees to grow to the size now attained by those in Bryant Park. Most of these would perish were the library built, and the present generation of children would be grown up before the corner gardens could assume a shady beauty.

But the question is not between the four proposed gardens and Bryant Park, but between the four gardens and Bryant Park as it might be with the reservoir removed. If this were ever taken down and the vacated area added to the space already open there can be no doubt of its paramount value for park purposes. There is no other space of such a size available between Madison Square and Central Park, and to condemn it to any other purpose would be to deprive New York of its only opportunity to meet a most urgent necessity. The city is not forced to decide between the loss of the library and the loss of the park, but between the loss of the park and the erection of the library somewhere else, which might not be a serious calamity. Bryant Park is a good site geographically now, but twenty years from now it will probably be too far down town. And even if the library were driven to some less attractive and accessible place, the people of the city could endure that with less regret than they would feel for the sacrifice of another considerable fraction of the scanty park area of the city. It has taken years of earnest labor by many public-spirited citizens to organize a public sentiment in favor of the sacredness of every foot of open space on Manhattan Island. There is reason to believe that the people have become determined to allow no disfigurement or curtailment of their parks, and to tolerate no scheme which diverts them from their primary purpose. It is to be hoped that this sentiment is sufficiently strong to defeat such a precedent as would be established by the covering up of Bryant Park with a public building.

The Botanical Garden of Dublin.

AT this time, when there is so much discussion of the establishment of a Botanical Garden in New York City, an account of the Botanical Garden of Dublin may prove of interest. From an article in a recent number of the *Gardeners' Chronicle*, written on the occasion of the tercentenary celebrations of the University of Dublin, it appears that the present Botanical Garden of Trinity College is to be the third of its kind attached to the University. As early as 1710 there seems to have been a Physic Garden which occupied the site of the present library, or, according to some traditions, that portion of the present Fellows' Garden which lies between the library and the Nassau Street boundary. Between 1791 and 1801 several attempts to establish a botanical garden which should be common to the University, the College of Physicians and the Dublin Society proved unsuccessful. But, in the mean time, Dr. Hill, the professor of botany, had rented some ground at Harold's Cross for the purpose of a botanic garden, and he was assisted to some extent by the college. In 1801 a curator was appointed, but it is clear from the college accounts that the plants and houses were to a very large extent, if not altogether, the private property of Dr. Hill, and we also learn from the same source that he was the means of securing for the Dublin garden, through Sir Joseph Banks, many of the plants and seeds brought to England from the South Seas by the members of the exploring expeditions of the time. The article goes on to say:

In July, 1806, the site of the present Botanical Garden at Ball's Bridge was leased by the college for one hundred and seventy-five years at a rent of fifteen guineas per acre. The present garden was commenced in the autumn of 1807, and consisted of about three acres of ground as represented to-day by the botanical portion proper—namely, that situated within the old walls—and the oldest and largest of the trees in this enclosure were mostly planted in the spring of 1808; so that the fine and graceful American Elm, the tallest tree in the garden, the Copper Beech, the characteristic Cedar of Lebanon, and the Italian Stone Pine, the Manna, or flowering Ash, the weeping Elm beside the pond, and other less notable trees have all grown to their present dimensions in a little over eighty years.

In 1832 an addition of about two acres was made adjoining the Blackrock Road, now Pembroke Road, so that the finest of the specimen Hollies, the weeping Beech, Pinus, Platanus, Oak, Arbutus and Garrya here to be seen are only about sixty years old at the most, and show what has proved possible in a town garden in so short a time.

The latest addition to the garden was made in 1848 by the further enclosure of about three acres, or less, which now adjoins the Lansdowne Road, this having been taken in "with a view to admit of a screen being planted parallel to the older north-west wall, and thus afford sufficient protection against smoke, buildings, etc." The last extract from a report prepared by the first curator and designer of the garden, the late James Townsend Mackay, LL.D., illustrates his ability and far-seeing knowledge as a landscape-gardener, for on these two additions, and the exquisite fitness of their fringe of Ilex or evergreen Oaks and Hollies, depends whatever is verdant and beautiful, and sheltered in the garden at the present time.

Mr. John Bain, A. L. S., who was assistant-curator in Mackay's time, afterward succeeded him as curator, and the gardens were much improved under his care. Altogether, Mr. Bain was over forty years employed in the garden. His keenness as a botanist, especially his critical knowledge of native plants, and his remarkable skill as a cultivator, were recognized by the most noted botanists of the time, such as Professor Allman, Dr. William Harvey, Sir W. Hooker, the late Mr. Jas. Veitch, Rev. Wm. Ellis, and Archbishop Whately, who for many years was a constant visitor to the gardens. At this time many then rare plants were grown here with a success perhaps never surpassed. Of such were *Vanda cœrulea*, the true old *Cattleya labiata* and *C. violacea Harrisoni*, *Renanthera coccinea*, *Zygopetalum Mackayi*, *Mackaya bella* (a shrubby Cape Acanthad, founded by Harvey in compliment to Mackay, since called *Asystasia* by Hooker and Bentham in *Gen. Plan.*), *Erica Mackayana*, *Saxifraga elegans*, etc., were also introduced to public notice by Mackay. Here also Mr. W. Ellis and Sir W. Hooker alike saw *Ouvirandra fenestralis*, *Dionæa Muscipula*, *Cephalotus follicularis*, and the North American *Sarra-*

cenias, in luxuriant health and beauty; and the Cape Disa grandiflora bore flowers as large, and as fine in color, as Harvey had seen them on Table Mountain only a year or two before. Mr. F. W. Moore, now of Glasnevin, also had charge of the gardens, and by his zeal and well-directed industry contributed to their present prosperous condition.

Without undue boasting, it may fairly claim to be, in proportion to its size and general conveniences, a garden as rich in vegetation of all kinds as exists elsewhere in Europe. The main drawback is its proximity to dusty roads and to the smoke of the town. Its best features are excellent shelter—for reasons before expressed, a remarkably deep alluvial soil overlying a gravelly subsoil resting on chalk limestone, abundant moisture, and a climate much to be envied by those of more northern latitudes or farther from the sea.

Many plants, only half-hardy elsewhere, even in the same latitude, here exist perfectly in the open air. Especially noticeable in the garden are the walls which, while giving shelter from the prevailing winds, also serve in the conservation of the rarer of half-hardy shrubs, such as the Loquat, Carob Bean, *Mutisia decurrens* and the Chilian *Colletias*; Australian Blue Gums, or Eucalypti; the Japanese Wineberry (*Rubus phœnicolasius*), "Winter's Bark" (*Drimys Winteri*) from Magellan, and *Wistaria* from Japan; *Clematis alpina*, a sort of shrubby Anemone, from Austria; *Veronica Hulkeana* from New Zealand and *Berberidopsis corollina* from high up on the Chilian Andes. *Choisya ternata*, *Smilax latifolia*, *Zizyphus* (*Paliurus*) *spina-Christi*, *Solanum crispum* and *Mahonia nepalensis* also do well here. Here and there also various interesting rock-plants from the limestone or chalk, the granite from basal Cambrian, or old red sandstone, are here grown in extemporized niches or "pockets" especially prepared for them. You may see the Pyrenean *Ramondias* so grown, also Edelweiss from the Swiss Alps, and *Androsaces*, such as *A. lanuginosa*, from the Himalayas. The last-named plant was first flowered in this garden by Dr. Mackay in 1842. *Dianthus*, *Linarias*, *Erinus* and *Iris* of many kinds are at home on these wall-tops, and quite recently a special hollow plant-wall has been erected for these and other denizens of the rocky places of the temperate world. A small pond fed by the Dodder River is rich in *Aponogeton* and *Nymphæas*, several of Monsieur Latour Marliac's hybrid kinds having passed through the last winter unscathed. The great *Gunnera manicata*, with leaves five to seven feet across, is here quite at home, as also are the red and green veined forms of *G. scabra*.

The strong points of the garden are its large herbaceous borders, now gay with many summer flowers. It is also pre-eminently a garden of hardy bulbous flowers of all sorts, Snowdrops, *Crocus*, *Narcissus*, *Tulips*, *Iris*, *Lilies* of many kinds; and to see the *Crocus* or the *Narcissi* at their best here, late in March or early in April, is a sight not readily to be forgotten.

Overland in the Cayuga Country.—II.

VERY beautiful is the neat and quiet road in this high country beyond Trumansburg. Visitors who now and then come from some western state remark the absence of weeds in the fields and along the road-sides of New York and New England. Yes, weedy road-sides are rare in this Cayuga country. The sides have long since grown soft and smooth under the lapse of time and the occasional plowing and grading. The grass has crept over them in a hard and continuous sod, and the farmers mow them as they do their meadows. Now and then clumps of wild bushes have sprung up at will on the corners or in the hollows, and so long as they do not interfere with the roadway they are not disturbed. Although they may not tell you so and may not even know it themselves, these people have grown to love the copses and wood-lots for their own sakes, for the labor of clearing has long ago been forgotten, and the passion to cut away every green thing has passed away. How well I remember my early days in the woods of Michigan! Cutting and clearing and burning! These were the three merits of the pioneer, and it is little wonder that he came to look upon every bush and tree as a personal enemy. There was no quarter; everything must be swept from the land—every bush on the road-side, every tree in the fields. And long after the farms had been cleared and the roads had become settled and worn this passion remained. But it is gradually burning out, and the next generation will have forgotten it and will look with satisfaction upon the clumps of trees and bushes that here and there spring up in the waste places. The pioneer, and too often the lumber-dealer, have no patience with any talk about forestry—this science must find its chief inspiration in the older states.

One thing more about these roads I must mention in passing: there is no rectangular road system in New York as there is in most of the newer states. It is a blessing that this is so, although there was a time when I looked upon section-lines and quarter-section-lines as the fundamental desideratum in road-building. But I no longer think of a hard-and-fast rectangular road-system with pleasure. The "angling" roads are commonly the most direct communication between neighboring villages, and if they follow the natural trend of the surface as much as possible, they are always beautiful and interesting. Rectangular roads would be the ruin of this fine country, for to toil over hills and ride straight across the hollows and never follow the creeks would be intolerable. Stretching out to the south-west from Trumansburg is an old and well-traveled road which winds along the valleys to Watkins, at the head of Seneca Lake. I have long told my students that a curved drive is attractive largely because it presents new views at every point, but I never caught the full meaning of my own teaching until I drove on this old turnpike. In many places the curves follow each other so rapidly that the traveler is constantly on the alert for new scenes, and these scenes are all the more forcible when they strike one suddenly. But when we came out upon a long straight portion of highway, the feeling was wholly changed. The prospect pleased at first, but it soon grew monotonous, and we fell into conversation.

For ten miles beyond Trumansburg there is little change in the aspect of the country. We still keep within occasional view of Cayuga Lake, and the hills are lower than they were a few miles back. Near Farmer Village we find the first unmistakable evidence of the new life which is brightening the farms of much of this lake region, for here we come upon the Grape. The Grape interest of western New York is very large and is rapidly growing. The census of 1890 showed that the largest vineyard area of native Grapes in America is the New York region, including a strip of Pennsylvania lying along Lake Erie. Some 51,000 acres were found to be devoted to vineyards in this region, and the product sold in 1890 as table grapes was 60,687 tons. The heaviest Grape regions in New York may be said to be four, those lying about Seneca and Keuka Lakes, in Chautauqua County, facing Lake Erie, and along the Hudson. The Seneca Lake district, which is noted for its Catawba vineyards, is now extending itself eastward in this central and northern part of the divide toward Cayuga, and it has even now reached this lake. Most of the Seneca Grape district lies upon the west side of that lake and well toward its southern end, but its eastern branch is now making this broad expansion, the borders of which we have reached at Farmer Village. The particular interest at this brisk hamlet in a horticultural way centres in the Moore's Diamond White Grape, which is here planted more largely than elsewhere. One hundred acres of this variety were set in a solid block in 1891, and this spring fifty additional acres were planted alongside. The hundred-acre plot is now planted to posts, and at a distance it reminds one strongly of old burned tracts in the Pine plains of Michigan, every bleaching-post suggesting the stub of a tree. In all this great tract the ground is kept scrupulously clean. It will be a test vineyard of this new variety of Grape, and it will be watched with eager interest by every grape-grower in the north. There are few White Grapes which can assume to be market varieties, and there is yet much doubt among the more conservative growers whether a white grape will ever find an extensive sale. It is understood, however, that the Diamond is to be a competitor of the Niagara. It certainly has the merit of better quality, but its virtues in the vineyard and on the road are yet largely to be determined. It requires many years to learn the true merit of any Grape, or of any other fruit, for that matter. The value must be largely determined by the uniformity of its behavior during a series of years. And yet nurserymen and others ask the experiment stations for a report upon their fruits the very year following the planting.

Although this is a large vineyard, we shall find much larger ones. This, like most of these very large vineyards set to a single variety, belongs to a stock company. This concern is known as the Boyer Diamond Vineyard Company. Like all large enterprises, it is having a stimulating effect upon the community, and private vineyards are now springing. These new great vineyards are introducing many new problems into the grape business of western New York, particularly as regards hand-labor, which must be reduced to a minimum. The first revolution which it is bound to introduce is in methods of training. The training in common use on Seneca and Keuka lakes is a species of renewal, by which the wood is renewed each year back to the crown on the lowest wire. A cane is trained out in each direction from the head on the lowest wire,

and the shoots are tied to the wires above as they grow. This summer tying is expensive, and the new vineyards are therefore mostly adopting the Kniffen system. This system uses but two wires, while the other uses three, and the canes are trained out on both wires in opposite directions, and the shoots are allowed to hang, thus avoiding summer tying. This system is now the common one on the Hudson, and it is much used in Chautauqua. It has many merits for strong-growing varieties such as Concord, Worden and Niagara, and on the Hudson I have seen even so slender a variety as Delaware doing well trained upon this system. This Boyer vineyard at Farmer Village will be trained upon the Kniffen system, and its behavior will be watched with interest.

Cornell University.

L. H. Bailey.

Notes on the Flora of Smythe County, Virginia.—IV.

A MONTH and a day later, during the last week in June, we undertook a second trip to White Top. It was mid-summer in the Holston valleys, as far as temperature was concerned, and midsummer, too, in the world of vegetation, for flowers were few and nature was resting preparatory to putting on her autumn dress of Golden-rod and Aster, great quantities of which were just beginning to indicate their coming glory of gold and purple. For the first time we had fair weather on the Iron Mountain, and from the gap there were able to see the great sweep of the Alleghanies to the north and north-west. The steep summit of White Top was much more accessible than on our former visit, as the United States Coast Survey had, a few days previous to our arrival, ruthlessly cut long sights in two or three directions through the tall Spruces on the top of the ridge.

Since our first trip the Laurel (*Kalmia latifolia*) had bloomed and passed away, and the great ravine beyond the Iron Mountain was given over to Hemlocks, *Rhododendron maximum* and *Mitchella repens*. The *Rhododendron* was in bloom, and for miles we were surrounded by that stately shrub. At our feet the little Partridge-berry was at the height of its flowering season, and every inch of ground, even to the banks and cuttings along the road, was decorated with its long trailing vines, laden with the little fragrant flowers and many of the bright red berries of a former season.

In the deep woods, on the White Top slope, three Orchids were blooming. The little *Listera convallarioides*, a pretty inconspicuous greenish-flowered plant, grew mostly among mosses under coniferous trees, and in the same localities the handsome *Habenaria orbiculata* towered high above its humble relative. It is a beautiful plant, with two great round shining leaves spreading flat on the ground, and a slender, erect spike nearly two feet high, bearing large green and white flowers. The smallest of the three Purple Fringed Orchids, *H. psycodes*, was abundant all through the swamp and in the mountain rills, where it grew among the tall Bracken and other ferns. The great banks of *Diphyleia cymosa*, which had been in full flower a month earlier, were now in fruit, and *Trautvetteria palmata*, an exceedingly pretty white-flowered plant, bloomed in its stead, filling the woods for some distance on both sides of the road. Both *Picea alba* and *P. nigra*, both trees locally called Lash-horns, grew there, and we were told of the existence of two trees of *Abies Fraseri*, which, however, we were not fortunate enough to find.

The margins of the White Top field are bordered with what appears to be a series of old fruit-orchards. The majority of the trees were *Cratægus punctata*. The small leaf-buds only had been visible on our first trip; they had flowered in the interim, and the fruit was already half an inch long and very abundant. They were beautiful, crooked, wind-teased old trees, with flat, symmetrically spreading branches. With them were a few trees of *C. coccinea*, smaller and more shrub-like, though we did see one tree that was a foot in diameter. A few fine old Cherry-trees, *Amelanchier Canadensis*, two feet in diameter, *Pyrus Americana*, nearly as large, *Quercus rubra*, with Beeches and Birches, the two Spruces and an occasional Maple made up the majority of the trees along the summit, where on the topmost crags some very large *Menziesia globularis* was lingering, and the pretty *Vaccinium erythrocarpon* was flowering in great profusion. The common Wood Sorrel (*Oxalis Acetosella*) was there also, and we were very much interested in some of the little plants that had produced pink-purple flowers.

The luxuriant undergrowth of Ferns was in itself worth the journey. Along the edges of the field *Dicksonia pilosiuscula* had complete possession. Near the moss-hung cliffs there were great banks of *Aspidium spinulosum*, var. *dilatatum*, tall, magnificent specimens nearly three feet in height. In the Spruce-swamp and the woods below we found the va-

riety *Intermedium* of the same species, and growing with it *Asplenium thelypteroides*, *A. Filix-fœmina*, *Osmunda Claytoniana*, *O. cinnamomea*, the delicate light green *Aspidium Noveboracense*, *A. marginale*, and last, though by no means least as to size and beauty, the handsome dark green *A. Goldianum*. There was scarcely a flower to be seen, but, in their place, banks of feathery Fern-fronds of many shades of green. The finest forest that we saw during our many excursions into the highlands was the one on Pine Mountain, on the border of Grayson County, and the lowest of the three high peaks of the White Top range. If there is such a thing left in south-western Virginia as forest-primeval, it is to be found along Fox Creek, where for several miles we walked through the pathless tract of great trees. It was impossible for us to estimate the dimensions of the trees. The forest offered an apparently endless vista of massive branchless trunks that towered for a hundred feet or more above us into a great canopy of green, and many a prostrate giant proved too great an obstacle for weary feet to climb over.

The Sugar Maple, which is here the variety *Nigrum* is found in groves, and our young guide told astonishing stories of the large amount of sugar the trees produced. The Red Maple was there also as a large fine tree. The Black Walnuts' superb trunks, unique in size and beauty, were as yet undisturbed by the all-destroying lumberman. Chestnuts were beginning to bloom, and vied with the giant Tulip-trees in the straightness and breadth of their huge trunks. The Chestnut Oak, White Oak and Red Oak were also conspicuous members of the forest. Ashes were laden with fruit, and two Lindens (*Tilia Americana* and *T. heterophylla*) were beginning to open their little round flower-buds. *T. heterophylla* is one of the most showy of the deciduous trees of the mountain forest, its large, very dark green leaves, with the silvery under-surface standing out from the banks of lighter foliage in a particularly conspicuous way. The Beeches were covered with their little triangular nuts, and both *Magnolia Fraseri* and *M. acuminata* were also in fruit, the latter growing to a great size.

There was very little undergrowth, and flowers were few. On some of the boulders the great, smooth reddish canes of *Rubus Millspaughii* (a newly described species, first found in the mountains of West Virginia) grew over twelve feet long and were covered with broad white blossoms. *Clethra acuminata* was quite abundant in more open situations, and along the edges of the woods *Oxydendrum arboreum* was showing its white buds. So dense was the shade under the trees that the flaming *Rhododendron calendulaceum*, long past its flowering season in the open, was still in full bloom and reached nearly fifteen feet in height. Those who were intrepid enough to climb to the top of the mountain told tales of great Spruces over three feet in diameter. The forest is what is locally known as the Douglas tract belonging to some New York gentlemen, and it is to be hoped that it will not share the fate of the forests of the Doe River Gorge, that are being so rapidly exterminated.

One of the rarest of the mountain plants found that day was *Boykinia aconitifolia*, a pretty white-flowered species belonging to the Saxifrage family, growing on the stony edge of one of the little cold brooks with *Thalictrum clavatum*. Near it, on some tall cliffs, we found the nearly equally rare *Asplenium montanum*, not the plant with tiny fronds that grows in clefts of high mountain rocks, but a large beautiful plant with dark green fronds over six inches long, growing in spreading tufts along the crevices of the rocks.

New York.

Anna Murray Vail.

New or Little-known Plants.

Smilax glauca.

AMONG our common and familiar plants are many which gardeners know little about, and their beauty and value from the garden point of view is not realized. A number of such plants have been figured in this journal from time to time, because we feel that in making them known we are doing a real service to the owners of gardens who, ignorant of the true resources of the American flora, bring less desirable plants than those they could find growing almost at their doors from the four corners of the earth to decorate their estates. Such an unappreciated plant is figured on page 425 of this issue; it is the glaucous-leaved *Smilax* (*Smilax glauca*), a common inhabitant of dry sandy uplands from eastern Massachusetts to Florida and Texas. Like nearly all the species of the large

genus to which it belongs, *Smilax glauca* is an extremely ornamental vine. It is a rampant grower, with long stout stems armed with scattered prickles, large pale leaves, small green flowers, and clusters of handsome black fruit covered with a pale bloom. Less vigorous and less ter-

The genus *Smilax*, as represented in the North American flora, is a considerable one, and many of the species are still very little known or understood, many of them having never been cultivated, although in order to thoroughly comprehend their peculiarities they must be brought to-



Fig. 70.—*Smilax glauca*.—See page 424.

ribly armed than the more northern Bull Bay or Green Bay (*Smilax rotundifolia*), it grows to a good size in rich soil and is a useful subject for the wild garden, to drape rocks, to help in the protection of boundary plantations, or to use wherever a handsome hardy free-growing vine with tough armed stems is needed.

gether into a garden. Not long ago one of the most ornamental of the North American species was figured in these columns (vol. v., p. 53), and we hope from time to time to bring others to the attention of our readers, that the lovers of hardy plants may learn of their existence and value as ornaments of the garden.

Entomological.

Notes on Two Troublesome Borers.

IF William Cobbett, that enthusiastic Englishman who so ardently praised our common Locust (*Robinia Pseudacacia*) and advised its general introduction into Britain and Europe a century ago, could have had a few years' experience with the borer which almost renders the successful cultivation of the tree in New England a hopeless task, he would probably have qualified his expressions of admiration and commendation. But the Locust is now a common tree all over Europe, in many parts of which there are trees of fine proportions, and all, apparently, unattended or unaffected in the least by our handsome brown and golden-yellow banded beetle (*Cyllene Robinia*) which does so much mischief as a borer in the early stages of his life. The insect has apparently not yet been introduced into Europe, and there seems to be no reason or probability that it should ever be taken there. The only danger lies in the importation of young infested trees or affected lumber. But, excepting perhaps some peculiar varieties or forms which may be sent out by her nurserymen, or some rare allied species, plants are now never imported, for the species has become almost like a weed in some parts of the Old World.

Besides affecting the common Locust, this borer is also very injurious to the Clammy Locust (*R. viscosa*), the Rose Acacia (*R. hispida*), and in the Arboretum it proved a serious foe in the successful cultivation of the newly introduced *R. Neomexicana* from New Mexico. In fact, it appears more partial to the last species than to either the Clammy Locust or the Rose Acacia.

We are more frequently asked about this pest than almost any other. Like most other borers, this is a very troublesome insect to combat. It is usually more destructive to trees in the open and sunlight than to those growing thickly together in groups or woods. The best, and, in fact, the only suggested remedies are preventive. To give the trunks and larger branches a thick and thorough coat of whitewash, with a large proportion of soap in it, is the best we can do; and where idle children abound it would be an excellent plan to have them daily collect all the showy beetles to be found on the trunks of the trees during the season of ovipositing. It has even been suggested that children might collect the beetles from the flowers of Golden-rod, to which they seem very partial, and they are also to be found on Sunflowers, probably because the colors are protective. It seems to me that this would be less satisfactory than collecting directly from the bark of the trees they infest.

The beetles are very active, and when alarmed or pursued they will run surprisingly fast or will take to flight. It is generally stated in writings that the beetles are to be looked for in early September, but they should be watched for sooner, as many of them emerge in the latter part of August. Without having noticed or looked for them earlier, I found the beetles ovipositing on August 23d, this season. The eggs are quite large, much larger than might generally be imagined, of a dull white color, oblong and soft, and are to be found just under the edges of the roughest bark, or more particularly in places where the bark has been broken and where small limbs have been cut or broken off. Around the openings of their own burrows are also favorite places of the beetles in disposing eggs.

It will thus be seen that in applying any form of wash to the trees to prevent egg-laying it is extremely important to apply it thoroughly and thickly to all the rougher parts, from well up among the branches to very close to the ground. In this latitude it would appear that the wash should be applied as early as from the 20th to 25th of August. We have known the plan of cutting down badly infested trees to be practiced, trusting to suckers to come up and replace them, but when this is done the diseased wood should be burned before midsummer to prevent the escape of the pests within it.

Of course, it will be difficult to keep the pests in check in districts where Locusts abound everywhere unless radical measures are adopted, but where the trees can be easily numbered, as in most New England and northern towns, they could with a little care be kept comparatively free from injuries. It is particularly important to save and protect the trees when young, for the ravages of the borers then sooner cause their death or so weaken the stems that they break in high winds.

A Blackberry-root borer has appeared in the Arboretum in large numbers this season, causing much injury to the various species of this section of the genus *Rubus*. While it may have been abundant other years it has remained unnoticed, and the

death of the canes has been invariably attributed to winter-killing. An examination of the stumps of the dead canes cut off at the ground, this spring, shows a burrow and pupa in almost every one, the empty pupa-case sticking out of holes in the sides of the canes at an inch or two above the ground. The insects from these pupae are little day-flying moths, known as *Aegeria rubi*. Both at rest and when flying they have a startling resemblance to our common wasp or "yellow jacket," for which they might very easily be mistaken by the casual observer. The moths were found in considerable numbers on August 23d, some of them just emerged, and appearing more abundantly several days later, and when the Blackberry-bushes were vigorously shaken on a warm afternoon many would arise and flutter around. The eggs are deposited soon after this, near the root of the cane; on hatching the young borers work downward, burrowing in the crown or upper portions of the larger roots; they remain dormant all winter, renewing their activity in spring, and finally boring up the canes a little way or merely to the surface of the crown of the root in preparation for emergence late in August. The full-grown larva is about an inch long, of a light yellowish color, with a brownish head. This insect has been called a Raspberry-root borer, but in the Arboretum I have so far only noticed it as infesting roots of Blackberry, although Raspberry-plants are only a few feet distant. There appears to be no remedy for this pest but digging up and destroying the old roots and replacing them with clean young stock. If the old roots are taken up in the spring or autumn and burned, the whole brood of borers will be destroyed, and new invasions will necessarily have to come from other plantations or wild plants. Those who have been troubled with their Blackberry-canecaners not bursting into vigorous growth in the spring would do well to examine the crowns of the roots for borers before jumping to the conclusion that the variety of Blackberry was lacking in hardiness to withstand the cold of winter.

Arnold Arboretum.

J. G. Jack.

Foreign Correspondence.

The Rock-garden at Kew.

ONE of the most interesting and popular of the attractions at Kew is the rockery or rock-garden, a portion of which is shown in the illustration on the next page. It was constructed ten years ago on one of the lawns adjoining the hardy herbaceous plant department, near one of the principal entrances to the gardens. The manner of its construction will be gathered from the following extract from the *Kew Report* for 1882: "As the surface of the site chosen was perfectly flat, it was necessary, in order to get any variation of level, without moving large quantities of soil, that the main path through the rock-garden should be sunk. This path was first laid out in a winding course, so as to bring in as natural features the picturesque trees with which the ground was studded. The general idea which was finally worked upon was that of the rocky course of a stream, such as may be met with in some of the side valleys of the Pyrenees. Such streams dry up after winter, and are bounded by rock-piled banks, amid the crevices of which a copious summer vegetation springs up. Above the rocks an evergreen shrubbery growth descends wherever the soil is of sufficient depth. The path, eight feet wide and 514 feet long at the bottom of the rock-garden, represents the dry bed of such a stream. On either side fragments of rock are piled up in a manner as little artificial as was possible to a height of about five feet. Above this the view is limited by shrubberies of Box, Rhododendron, etc., rising to a varying height."

The natural soil of the site chosen was a perfectly pure sand. As much good soil as possible was therefore thrown in behind the rock-bank. As the stones were arranged good soil was worked in beneath and between them. For parts of the banks with a northern exposure tree-stumps were employed. The use of these has been a good deal criticised, but it is not wholly out of keeping with the general idea, and, as a matter of fact, they prove admirably suited to the growth of the larger and stronger growing species.

The principle of a rock-garden is to imitate the conditions of growth of deep-rooted plants. Almost all sub-



Fig. 71.—The Rock-garden at Kew—See page 406.

alpiners are of this character; the distance to which their roots extend makes them to a great extent independent of extremes of temperature and also of drought. They are all, however, intolerant of standing moisture, and flourish best on sloping broken ground from which water readily flows off and does not rest near the collar of the plant and its dormant winter buds.

The variety of conditions afforded by a garden of this character are necessary for the proper accommodation of a large collection of alpine and sub-alpine plants gathered from all parts of the world. The main difficulty is that of atmospheric conditions, which in a flat, low place like Kew are not always favorable to the growth of alpiners. Notwithstanding this, it is surprising how happy many truly alpine plants are in this garden, from the blue Poppy of the Himalayas (*Meconopsis*) and the imperial Primrose of the mountains of Java, to the Pyrenean *Ramondia* and the Pinks and *Campanulas* from the Swiss Alps. Planted in bays left here and there at the foot of the stones are such moisture-loving plants as *Trilliums*, *Arums*, *Hellebores*, and various kinds of bulbous plants, the shade-loving things, such as *Meconopsis Wallichii*, *Ranunculus Lyallii*, *Myosotidium nobile*, *Primulas*, *Ramondia* and many Ferns occupying those parts which are protected from the sun's rays by tall *Hollies*, *Pines*, *Limes*, etc. A bog formed of peat, into which water trickles constantly from a jutting rock above, is devoted to a collection of bog-plants, and in another part an imitation old wall is clothed with *Cacti* and other suitable plants. At the foot of this wall is a peat bed in which hardy *Orchids*, *Equisetums*, etc., find congenial conditions.

Surmounting the bank of stones and in front of the belt of shrubs are such stately plants as *Liliums*, *Cistuses*, *Rheums*, *Arundos*, *Single Roses*, etc., and on the higher mounds, mixed with the bushes of *Box* and small *Deodars*, such striking early summer-flowering plants as *Foxgloves*, *Delphiniums* and big *Poppies* are used with good effect.

Entering at the south end behind some magnificent *Hollies*, one winds along first through Ferns, then into the sunshine, where the sun-loving plants are, the picture ever-changing, yet never flagging in interest until the end is reached. Of course, such a garden is only possible where careful cultivation and constant attention are available. The strong-growing plants must be kept within bounds, and the needs of the small and delicate properly supplied. Without these a rock-garden would soon become a hopeless tangle of weedy plants, but with them it may be made what it is at Kew, one of the most interesting and delightful of the many departments of horticulture.

London.

W. Watson.

Cultural Department.

Summer Greenhouse Climbers.

ONE of the best climbers with ornamental foliage is *Abutilon vexillarium igneum*. It is an excellent plant for rafters, as the branches have a drooping habit, and for the same reason it is admirable in hanging baskets. The leaves are small, compared with those of other members of the genus, but beautifully blotched with light and dark green and pale yellow. The red and yellow flowers, produced in autumn and winter, are also beautiful. It thrives well in a mixture of peat, loam and sand, and should never be subjected to a temperature lower than forty-five degrees.

The *Allamandas* are admirable summer-flowering plants. *A. cathartica* is the earliest to bloom, and its comparatively small bell-shaped flowers, of clear yellow color, are produced in profusion. The larger flowers of *A. Hendersonii* are rich golden yellow, and those of *A. Schottii*, perhaps the best of all, bright yellow. These plants require ample room, and are most suitable for covering walls and rafters in lofty houses, though they are sometimes grown in pots and trained to trellises with good effect. They like a moderately rich loamy soil, and in the growing season require plenty of water, with less moisture in winter.

Bougainvillea glabra is a desirable climber, extremely showy, and not exacting in its requirements. On the roof

of a large house, and not trained too rigidly, it grows freely, and flowers profusely during the summer months. The whitish flowers, however, are insignificant, but the large rose-colored bracts which accompany each small cluster make a charming contrast with the bright green foliage. It should be planted in a rich loamy border, with rest in winter. The temperature may then fall to forty-five degrees, and the plant should be pruned moderately before the growth commences in spring.

Cissus discolor is a fine old plant for pot-culture if the stems are trained to a trellis, though it loses none of its attractiveness on pillars, rafters or walls. It is grown for its richly colored leaves, which are of cordate-lanceolate shape, green of various shades, beautifully mottled with crimson and silvery white on the upper surface, and reddish purple underneath. It requires a stove temperature.

Clerodendron Balfourii is another remarkably handsome stove trellis-plant, blooming profusely in early summer. The dark green leaves are opposite and ovate, and the flowers, produced in large panicles, have a conspicuous, inflated, pure white calyx and brilliant crimson corolla. The young growth should be thoroughly ripened after the flowering period by the free admission of air and light; a maximum temperature of fifty degrees will suffice in winter, when water should be given in only sufficient quantity to preserve the wood from shriveling. Prune in the spring, removing all decayed wood and cutting the previous year's shoots back to two or three joints. The weaker ones require to be most severely dealt with.

Dioscorea illustrata is a plant of the same type of beauty as the well-known *Cissus discolor*. The cordate leaves are very large, measuring ten inches in length by six in width, of rich deep green color, with parallel veins and a large central blotch of silver-white on the upper side, the lower one being bright purple. The stems die down annually, and the tuberous roots should be stored in a dry cool place, secure from frost, until the following spring, when they may be potted and placed in stove-heat. *D. illustrata* grows rapidly in rich sandy loam, and has a splendid effect when trained to pillars or columns.

Lapageria rosea is one of the best plants for a cool house—that is, one which is kept as cool as possible by shading and airing in summer, and warm enough in winter to exclude frost. Its ovate-lanceolate leaves are dark green and glossy, and the large waxy flowers deep crimson, with a profusion of small white spots on the interior. Portable specimens may be produced by cultivation in pots, but the plant is more thrifty when grown in a specially prepared border and trained to the roof of the house. The drainage should be perfect and the soil rich and porous. Good fibrous peat and well-decomposed cow-manure, both in pieces not smaller than a good-sized hand, with a liberal admixture of lumpy charcoal and sandstone, form a first-rate compost, which should be firmly pressed about the roots. The young shoots which start from the soil are by far the best, but they have a deadly enemy in snails. The ravages of these pests may be prevented, however, by placing a large rough band of cotton-wool around the base of each shoot, renewing it when it becomes saturated with moisture. *Lapagerias* dislike strong sunshine, and they should therefore be shaded at all seasons during bright weather. *L. rosea alba* is a white-flowered variety fully equal to the species in merit, and the two plants make a pleasing combination when grown together.

Plumbago Capensis is very effective on walls, and is a mass of bloom all summer. The flowers are of a charming pale blue shade, produced in large, dense, terminal clusters. The plant should be pruned pretty closely after the flowering period, and kept dry at the roots in winter. It succeeds well in a cool temperature, but abundant light and sunshine are essential to the best development of flowers, and a rich sandy loam is all the roots demand in the way of soil. *P. Capensis* may also be used to ornament low outdoor walls in summer. The plants for this purpose should be grown in pots, plunged in the soil at the base of the walls to be covered, and wintered in a cool greenhouse or a light airy cellar.

Rhodochiton volubile is exceedingly graceful in habit. It is admirable for rafters, to which the main stems should be trained, allowing the shorter branches to hang downward. These branches are clothed with pale green, cordate leaves, from the axils of which proceed the flowers, borne on long, slender pedicels. The plant is in bloom at all times, and the flowers have a prominent bell-shaped calyx of rosy color, and a dark purple, tubular corolla. The temperature of the house in which it is grown should never be allowed to fall below forty-five degrees, and it should be planted in a mixture of rich loam and leaf-mould, in equal parts, adding sufficient

sand to keep the mass porous. Great care should be exercised in watering, as the plant invariably "goes off" if the soil becomes sour to the smallest extent through excessive moisture, though it may be speedily replaced, as seedlings grow rapidly, and the seeds are freely matured.

Solanum jasminoides is another good cool-house plant. It is a free grower, and makes a singularly elegant covering for columns or rafters. The flowers, borne in large pendent clusters, are bluish white, often pure white, with a showy bunch of yellow stamens in the centre of each. The plant will make satisfactory progress in any ordinary potting soil, but preference should be given to that of a loamy character.

Stephanotis floribunda is an old and deservedly popular occupant of our stoves. The large oval leaves are opposite, leathery in texture, and of deep green color. The tubular flowers, with spreading five-lobed limb, borne profusely in large axillary clusters, are pure white, of waxy substance, and deliciously fragrant. It is an admirable plant for any purpose in which a climbing plant may be utilized, and grows well in any compost, the chief constituent of which is rich loam. When grown in pots—for which purpose it has no rival in beauty—it should be rested in winter and pruned sparingly, removing, however, all superfluous material. After repotting in spring, the old stems and branches should be carefully trained to a trellis, allowing the young shoots, when they appear, to twine around strings attached to the roof of the house. It flowers more freely where this system is followed, and the new branches can be taken down and attached to the trellis, just before the flowers expand, without serious trouble.

Stigmaphyllon ciliatum, the Golden Vine, a somewhat uncommon but very attractive plant, requires an intermediate temperature. It soon covers a large area, its cordate, ciliate, pale green leaves forming a close mass. The large *Oncidium*-like flowers are of deep golden-yellow color, and freely produced in clusters of fair size. It thrives vigorously in a mixture of loam, peat, leaf-mold and sand.

Tacsonia Van Volxemii is a magnificent plant, with flowers resembling in shape those of the Passion Flower, to which, indeed, it is closely related. They are from four to five inches in diameter, and deep rich crimson. The plant should be trained in the same manner as *Rhodochiton volubile*, and thrives satisfactorily under the same conditions, adding peat to the compost.

Cambridge, Mass.

M. Barker.

Roses.

AT this season there is but little to be done among outdoor Roses, except to give the usual attention to cultivation and watering, the latter being of no value unless done thoroughly, while the cultivation is especially necessary during dry weather. As the nights become cooler the Teas will produce better flowers, but it should always be remembered that outdoor flowers, as well as those grown under glass, will be much improved by being cut early in the morning and immediately placed in water. This method improves both the size and color of the flowers, besides making them more durable.

Hybrids for early forcing will now be ripening their growth, and will naturally need less water in order to hurry this process, for it will be remembered that the earliest crops require much more time for their development than those that more nearly approach the natural flowering season.

The most serious pest the Rose-grower of the present day has to contend with appears to be the nematodes, or eel-worms, to which frequent reference has been made during the past year in GARDEN AND FOREST and other horticultural journals. Unfortunately, no specific has thus far been discovered for this pest, the various so-called remedies having all failed under the careful tests of specialists. The most reasonable suggestion that has been offered for their destruction is that of baking or cooking the soil before placing it in the Rose-beds; but this is an operation of considerable magnitude even in a small establishment, and where Roses are largely grown it becomes a very formidable undertaking. It has been suggested that a portable oven of large size and heated by means of steam-pipes would solve the difficulty; but the expense of such an arrangement would work against it in many establishments, especially in those in which the present heating apparatus is not suitable for such purpose.

Lime in various forms has been given thorough tests in several places during the past season and apparently has no effect whatever on the eel-worms, and tobacco extract (which has also been recommended) has not proved any more effectual.

The beautiful Tea-rose *Cornelie Koch* is more rarely seen since the advent of the *Bride*, which is a much freer bloomer.

During hot weather the *Bride* is of little value, however, and then *Cornelie Koch* proves quite useful. In the winter *Cornelie Koch*, though producing large and fine flowers, is not to be compared with the *Bride*.

At least one of the new American pedigree Roses has attracted some attention from cut-flower growers, for I recently saw a bench one hundred feet long filled with *Golden Gate*. The grower seemed well pleased with it, and claimed it to be of about the quality of *Safrano*. The flowers of *Golden Gate* are not very large, but are pretty in the bud, and the plant is generally well spoken of as an outdoor bedder.

Another new Rose of much promise, though not of American origin, is *Empress Augusta Victoria*, a hybrid Tea that was slightly tested last winter, and will have more extended trial during the coming season. In color, this rose is white, and the flowers are shaped somewhat like those of the *Bride*, the petals having good substance, and in addition to this the blooms are delightfully fragrant. The growth of this variety seems strong and the foliage is of good texture, while much is claimed for its free blooming.

It seems unfortunate that so promising a variety as *Waban* once appeared to be should have proved so unsatisfactory as it has done. It is possible that all the fault did not lie with the variety, as it is more than probable that over-propagation so enervated the stock as to injure what might otherwise have been a useful variety.

Holmesburg, Pa.

W. H. Taplin.

Iris Lorteti.

THIS most beautiful Iris, belonging to the *Oncocyclus* section, was discovered some years ago between Meis and Hounin, in South Lebanon, by Dr. Lortet, the accomplished naturalist of Lyons. It was described by Barbey, *Herborisations au Levant*, p. 178, 1882, who there gives a large colored figure of it. Thanks to the unwearied zeal of Mr. Max Leichtlin, a considerable stock of roots has recently been imported from Palestine.

The *Oncocyclus* group of Irises is best known through *Iris Susiana*, which has been in cultivation in western Europe for more than two hundred years, and is still more widely grown than any other member of the group. *I. Susiana* has its home in western Persia, and stretching away toward the Caucasus lives the next best-known, *I. Iberica*. This part of the world may, indeed, be regarded as the centre of the group, and as we pass westward along the southern regions of Asia Minor we find several forms, more or less closely allied to *I. Susiana*, all of them beautiful. Near Mardin grows the lovely *I. Gatesi*, not far off the striking *I. Heylandiana*, more to the west, in Cilicia, the handsome *I. Saari*, and in Palestine is found an Iris which, sent to me from the neighborhood of Nazareth, I exhibited at the Royal Horticultural Society some two or three years ago under the provisional name of *I. Saari*, var. *Nazarena*.

Iris Lorteti, in general features, comes very close to *I. Saari*, and especially, perhaps, to *I. Nazarena*, but its wonderful coloring puts it by itself as, perhaps, the most beautiful Iris in the world. In the specimens gathered by Lortet, the outer segments are described and figured as showing a very pale blue ground covered with crimson spots, which, scattered sparsely over the marginal parts of the fall, are concentrated into a dark crimson patch or "signal" in the centre beneath the end of the style; the inner segments, or standards, are similarly described as being of a delicate pale rose. In a plant flowered this summer by me, the falls showed a creamy yellow ground marked with crimson spots, concentrated at the centre into a dark crimson signal, while the standards were nearly pure white, marked with very thin violet veins hardly visible at a distance.

I learn that the plants imported by Mr. Max Leichtlin show considerable variation in color; apparently, however, the "note" of the plant is a peculiarly charming combination of crimson spots, and blue or violet veins, on a white or creamy yellow ground.

The flower figured by Barbey is as large as that of an ordinary, or rather smaller *I. Susiana*. It is perhaps hardly necessary to add that the flower has the characteristic features of its allies; an oval fall convex from side to side as well as reflexed vertically, bearing a loose beard of scattered hairs, an orbicular, erect standard, and a nearly horizontal style lying close on the claw of the fall, and bearing conspicuous semi-circular crests.

Barbey describes the leaves as being very narrow, though his figure somewhat contradicts this, and in the plants grown by me the leaves are very distinctly broader and more ample than in *I. Susiana*; indeed, it appears to me to promise a larger foliage than is possessed by any other *Oncocyclus* Iris.

As regards cultivation, I have come to the conclusion that all these Palestine *Oncocyclus* Irises should be treated in this country by the "taking up" method—at least, until they have become acclimatized, if ever they do. But one or two points appear to be essential for success by this method. In the first place, they should be planted quite late—say in October, or even in November, according to climate; this prevents their making any growth of leaves before winter comes on. In the second place, they must be protected during winter and early spring, so that the young shoots receive no injury from frost. As soon as the foliage, after flowering, begins to lie down, they should be taken up, well ripened in a sunny greenhouse, and kept absolutely dry until it is time to plant them again. The object of this treatment is to secure their not making any very active growth until fairly warm weather sets in, so that when they are hardest at work they may be comforted by genial sunshine, and not buffeted by autumn rains and winter frost as they are when they are left in the ground or planted in early autumn.—M. Foster, in the *Gardeners' Chronicle*.

[The natural conditions of climate in large portions of California are such as are required for the successful growth of this beautiful section of Irises which grow under similar conditions to the *Calochorti* and *Brodiaëas*. The *Oncocyclus* Irises would be a gain to the already rich flora of California, and, incidentally, would probably prove profitable plants for export.—Ed.]

Onions at the North Carolina Experiment Station.

IN our Onion tests this year all the varieties grown made a fair crop from the seed, and some varieties, including all the Italian sorts, made a big crop, when the character of the land, a hard-baking red clay, never before cultivated in vegetables, is taken into consideration. In every instance those that were transplanted young made the larger onions. This was true not only of the Italians, but of the Wethersfield Red and Southport Globe, which last, while not growing to an enormous size, made a crop of beautiful onions, and promises, on better soil, to be a fine variety for this climate. All the varieties grown will be exhibited at our state fair, in Raleigh, in October, for the purpose of demonstrating the varieties that can be grown from seeds. We were also pleased with the white Potato Onion. This, of course, must always be grown from sets, as, like the brown Potato Onion, it makes no seed. Our sets were planted in February. They will do better set out here in October or November. This white Potato Onion ought to be a profitable crop for our southern market growers, because of its earliness, and it promises to be a better keeper than the old variety.

On suitable soils I cannot see why the cultivation of the Italian and Spanish Onions, from fall-sown seeds transplanted in February, should not be profitable in the south. Some object to the labor of transplanting, but it is no more irksome than pulling out sets. A shallow furrow is made, the plants are laid along two and a half to three inches apart, with tops all leaning one way, and a little soil drawn over them and pressed tightly with the foot. The thing to avoid is getting them too deep in the ground. This way of planting is more rapid and easy than setting them with a dibble, and they can be put in at a more uniform depth. We propose to plant another crop this fall to show the difference between fall and spring sowing; but there is no doubt that good crops can be grown here by simply sowing the seed in February.

The Mammoth White Pompeii and White Garganus made the largest onions. Queen was earlier and of good size. Barletta matured at about the same season, and the transplanted Barlettas were as large, or larger, than the Queen. I see little difference between Barletta and Marzajola. White and Pink Bermuda made fine crops, particularly the transplanted ones. Giant Rocca is superb and very uniform in size. White Portugal made a fair crop. Wethersfield Large Red was not extra large, but uniform and solid. Southport White Globe is handsome and uniform in size, and, though not so much improved by transplanting as the Italian sorts, is well worth growing in this way. As already remarked, I regard it as very promising for cultivation here, though not so early as some other varieties. The season was later, and the constant deluge of rain kept all varieties growing later than usual, but all ripened well.

Raleigh, N. C.

W. F. Massey.

Torenia Fournieri is so generally classed as a tender annual that it may be well to note that it is apparently incorrectly rated as such. An abundant crop of plants now in my garden

is the produce of self-sown seeds from last year's plants, which indicates that they are properly hardy annuals. The seeds have evidently strong vitality, as they lay dormant in the wet border during the winter and spring, only germinating in July, or, at least, no plants were noticed before that time, and if any appeared they were raked out in loosening the soil.

This is one of the most beautiful and useful of the small annuals, and is too seldom cultivated; at least, it is unfamiliar to others than those accustomed to greenhouse flowers. While it is useful in the greenhouse it is attractive in the borders, and, probably, would long since have been more generally grown out-of-doors if it were understood how easily it is managed. Probably, also, the lack of a common name has militated against it, a taking, easily remembered name seeming to be a necessity if a garden-flower is to be popular, a point well understood by the astute florist. A case in point was recently told me by a seedsman. He one year catalogued a rather novel *Ipomœa* with picture and description, but it met with no notice and practically no sale. The next year it was catalogued as a Morning Glory with the same picture and description, and the sale of several thousand packets resulted. If we are sometimes disposed to criticize the catalogue makers for their plant names, it may be well to remember that this is not an unmixed evil, as gardens are thereby enriched with plants which, offered only under a scientific name, would attract no notice or sale. Good plants in gardens, though wrongly named, are yet distinct gains.

Tom Thumb Dahlias.—Under this name last year an English florist offered a strain of plants originated with Mr. T. W. Girdlestone, a well-known English amateur. These were offered here this season by Messrs. Peter Henderson & Co. The half-dozen plants in my garden prove to be interesting, though taller than expected, being from eighteen to twenty-four inches high. This, however, is not a disadvantage, as, were the plants more dwarf, the flowers would inevitably be spattered with earth by every rain. The flowers are single and of the usual form and brilliant colors of the taller singles. Growing with these are seedling plants of a French strain which are practically of the same type, equally dwarf, showing that the strain is well fixed.

At present the two lots of plants prove that seedling single Dahlias will progress as fast and come into flower as quickly as rooted cuttings or tubers. Of course, Dahlias are late summer and fall flowers, never doing well until the cool nights come, so that if one has facilities for starting seedlings, say, in April, there does not seem any advantage in planting tubers unless some special color is desired. The flower-stems of the dwarf Dahlias are short, making it necessary to mutilate the plants somewhat in securing flowers with sufficient effective foliage. For a low border they are useful at this season either alone or in front of the taller-growing kinds, as they have abundant foliage and are covered with the most effective and brilliant flowers, in grace perfect foils to the somewhat lumpy but favorite doubles.

Elizabeth, N. J.

G.

Correspondence.

Some New California Plants.

To the Editor of GARDEN AND FOREST:

Sir,—This has been a peculiar season in California, but all bulbous plants have prospered beyond expectation. I have some new native plants of this class which may be worth noting.

Calochortus nudus is a rare form with a small lilac blossom much like that of *C. lilacinus*. It is found in damp meadows in high altitudes, but with me it thrives in a sandy loam. *C. Plummeræ* is a new *Calochortus* of the Mariposa section, and of striking beauty. The large shapely cups grew about two and a half inches across, yellow at the centre and a rich shade of purple without, while the entire inner portion is lined with long fine hairs colored like the petals. It comes from the dry table-lands of southern California. Another distinct Mariposa Tulip is *C. macrocarpus*, from the Sage-brush deserts of north-eastern California, the other extreme of the state. In beauty of coloring it rivals all others of its class, being a pale violet. The flower is large, the petals not very full, and the habit poor, as the leaves dry up before the bloom appears, and the stalk is stubby and very stiff. I find one trouble in growing these desert forms of *Calochortus*, and that is a fungus which attacks them when in full leaf and destroys every vestige above ground, and sometimes even descending to the bulb. This fungus comes from their native home and is little inclined to injure other species of *Calochortus*.

Perhaps the most beautiful *Calochortus* of the Mariposa section I have had this year is one allied to *C. venustus oculatus*. In years past I had noticed in some spots remarkably large, finely formed blossoms highly colored and marked differently from the type, but I had attributed this distinction to the sticky clay soil where they were always found. A bed planted with these in the same soil as others continues to show the same attractive characters, and marks it as the choice form among Butterfly Tulips. In this variety the blossom is very large, the outline of the petals full, so that they overlap. The lobe of the petal is creamy, with a band of maroon instead of the maroon eye, and a yellow rim, while the centre shows bright red shadings. The plant is remarkable for its capacity for propagation, as each stalk has from two to four large offsets which become small blooming bulbs the second year. A few bulbs of this would in a few years form a large mass. In a wild state it grows in a sticky wet clay, but it has done as well in the clay loam so well suited to the other varieties of *C. venustus*.

One of the prettiest of the new varieties I have tried has flowers of a shell-pink tint, and between *C. pulchellus* and *C. albus* in form, although when the flower is fully open it shows the stamens and pistil. It is an exquisitely delicate thing, and it thrives well in sandy soil. *C. amœnus* is its name.

Those who admire *Brodiaea laxa* will be interested in *B. peduncularis*, an allied species with the same general habit, pure white flowers, and pedicels elongated, so that an umbel is frequently a foot across. It loves a rich soil and abundant moisture. I found it growing luxuriantly in the gravel in flowing streams and in peat-swamps. As it remains dormant until late, it might do well for spring-planting in the east. *Brodiaea*s, generally, while they will grow in any soil, even the thinnest and poorest, love a rich alluvial soil, and grow luxuriantly in such situations. Wild-blooming bulbs in a single year of cultivation will increase from two to five times in size, blooming proportionally strong. They need good drainage and sunshine, and a shallow soil five or six inches deep is better than a deep soil.

A recent note in GARDEN AND FOREST on *Heuchera sanguinea* reminds me to say that the most admired plant in my yard is an immense one of *H. micrantha*. It is in a shaded spot in clay loam, and a solid mass a yard across. The leaves are always beautiful, but in fall they take on very rich coloring. The separate blossoms are inconspicuous, but make a filmy mass most attractive and useful for bouquets. Indeed, I find great pleasure with most of the *Saxifragæ*s, and there are few of the family that do not merit a place in the wild garden. In California, outside of the coast, it is hard to keep annuals moist enough to thrive during our hot summers, and comparatively few of the host seen in the eastern gardens find a place with us. But from those things which love heat we can obtain a world of satisfaction—*Verbenas* luxuriate, *Cannas* grow like weeds, and all of the composites are in their element.

Ukiah, Cal.

Carl Purdy.

Spiræa Aruncus.

To the Editor of GARDEN AND FOREST:

Sir,—This herbaceous *Spiræa* is a tall rank grower and perfectly hardy everywhere. Its creamy white flowers are very small, but they are crowded in such long, many-branched pyramidal panicles that when in bloom this plant compares favorably with the choicest of the florist's perennials. In south-western Missouri, on the southern slope of the Ozark Mountain, it covers the deep and narrow gulches, or gorges, so prevalent here, and seems to prefer a situation of this kind; for while a few specimens are found on gently sloping hills I have never yet seen one growing on level lands. However, when transplanted to the garden or perennial border, they thrive very well, especially if given partial shade. They are admirable in bouquets, where they serve as a foil to large showy flowers, which never appear so well as when combined with soft feathery flowers that suit their outlines and soften their overbrilliant colors.

Several times they have been enthusiastically praised by visitors born and bred in this part of the country who yet did not recognize them in their new surroundings. One lady made a special trip to ask the name of the feathery plant I used in bouquets, utterly ignorant of the fact that she had passed several score of the plants by the road-side as she came to town. It is not unusual for the country people here to be indifferent to the beauty of their native flowers, but their failure to recognize them when growing with cultivated ones

shows only too plainly how much the popular taste needs to be cultivated.

Pineville, Mo.

Lora S. La Mance.

Recent Publications.

Trees of the Northern United States. By Austin C. Apgar. American Book Company, New York.

Perhaps one-half of our adult male population would be able to distinguish an Oak from a Maple; but those who can tell the difference between a Sugar Maple and a Norway Maple, or between a Spruce and a Fir, not to speak of their ability to identify the different species of Spruces or Firs, constitute a small fraction even of our intelligent people. This would be surprising if their knowledge of other objects which they cannot help seeing and hearing every day was more exact—if the more common birds could be recognized by their notes, or if a "bug" or a "worm" were not about the most definite and specific names they would be able to apply to any individual of the teeming millions of insect-life about them. No doubt, the prevalent system of education is responsible to a certain extent for this general lack of the observing habit—a habit which is an original part of the mental equipment of every child; and if school-training has in any way helped to suppress this inquisitive tendency, those educators are engaged in a worthy work who are trying to introduce into schools a kind of study which goes directly to natural objects rather than to books which treat of these objects. This little volume is an attempt to direct both teachers and pupils in the study of the trees, both wild and cultivated, which are found east of the Rocky Mountains and north of the southern boundary of Virginia and Missouri, and it embraces so large a proportion of the trees which grow south of that line that it will be found a good text-book for the schools of the southern states.

The aim of the book is primarily to promote the study of natural science in the natural way; and trees are selected as its special subject, because they are always and everywhere present, and have a certain interest for everybody. In the ordinary text-books of descriptive botany the parts primarily examined are the flowers and their organs, but as these are generally fugacious, inconspicuous and often inaccessible, in this book the attention is directed to the parts which can be found throughout the greater part of the year, and the parts, really, which every one must become acquainted with who learns even to recognize the different trees. The leaves particularly, the wood, the bark, and, to some extent, the fruit are the characters chiefly noted. There is an artificial key which is very ingenious and which will help the beginner in his identifications; there is a glossary of such descriptive words as are needed, and brief descriptions of the species in their botanical order, with good outline figures of the leaves of every one. In a condensed manual of this sort no two persons would include exactly the same material. We should have preferred, for example, to see more than one species of Tamarisk named, and we feel that the foreign Lindens have not been fairly treated. But the book has been prepared with care and sound judgment, and is plainly written out of the personal observation of the author.

Its prime merit, however, is not in the information it gives about trees, but in the skillful way in which it directs the inquirer to study the trees themselves. The chapter on leaves is truly said to "be devoted mainly to the words needed for leaf-description," and the aim throughout is to teach the learner "to employ his own senses in the investigation of natural objects, and to use his own powers of language in their description." So far as any one does this he is working in the line of genuine scientific research. We cannot all become accomplished scientists in any line, but it is possible for every one to become interested in and acquainted with the trees of his neighborhood, and Professor Apgar's book is the best help available to any young person who wishes to begin this useful and fascinating study.

Notes.

The vintage will be smaller in California this year than it has been for five years past.

Among Palms in commerce *Areca lutescens* seems the most popular in this country, and sells the most readily.

Mr. C. D. Ball, well known as a grower of Palms, in reply to the question whether he had experienced of late much trouble on account of the failure of Palm-seed to germinate, answered in a late number of *The American Florist* that he had. The demand for Palm-seed is so great that it is not easy for

collectors to meet it, and consequently old seed is often worked in with the new.

The famous Black Hamburg Vine at Speddoch carries more than 500 clusters of grapes this year, and some of the larger ones will weigh four or five pounds. Last year more than a thousand pounds of fruit were cut from this vine, and the crop this year will reach at least 1,200 pounds. The girth of the vine, which was originally a cutting from the Hampton Court Vine and set in the early part of the century, is now two feet and four inches.

It is stated in *Meehans' Monthly* that if Kieffer Pears are gathered a little before they are mature and then ripened slowly in a room that is cool and not too dry they will rank as table fruit of the first quality. No doubt, rapid ripening impairs the flavor of some pears, but persons who are familiar with the Kieffer as it is found in the market, will find it hard to believe that any skill can transform it into a dessert pear of unexcelled quality. Its value for canning is generally acknowledged.

Just now the Spice-bush is very attractive, as its bright red fruit shows through the rich green foliage. Indeed, it is beautiful the whole season through. It is among the very earliest of native shrubs to bloom; its leaves are of a fresh color, and free from diseases or insect attacks, and its fruit gives it a new value in autumn. An occasional cutting back will overcome its tendency toward a habit too open, but on the borders of woods or shrubberies it needs no attention, and is always satisfactory.

In the early part of this century extravagant expectations were raised over the possible advantages of soil analysis, and when these high hopes were found delusive a prejudice was excited against all such analysis, which is not yet outgrown. It is pleasant, therefore, to note that some scientists remember that the study of soils may have a practical bearing on agriculture, and Professor E. W. Hilgard's report on the Relations of Soil to Climate, lately published by the Department of Agriculture, will be welcomed as a timely contribution to the subject.

The last bulletin of the New York Experiment Station repeats that there is no question as to the efficacy of the Bordeaux mixture as a preventive of the leaf-blight which has been so destructive to Strawberries in many parts of the country this year. The young plants should be sprayed the first year as soon as they become established, and the mixture should be applied four times during the first season, and at least twice before fruiting the second season. The mixture is now prepared with only half the strength originally used, the formula being two pounds of lime and three pounds of copper sulphate with twenty-two gallons of water.

Urceocharis Clibrani is the name given by Dr. Masters to a hybrid between *Urceolina pendula* and *Eucharis grandiflora*, and originated by Messrs. Clibran, of Oldfield Nurseries, Altrincham, England. Judging from a figure in the *Gardeners' Chronicle* the flowers are curiously intermediate in form between the two parents, and they are very beautiful and interesting. The flowers are borne on ascending stalks as in *Eucharis*, not pendulous as in *Urceolina*. They are pure white, borne in umbels, each one two and a half inches long with a slender tube expanding into a cup-shaped limb. The new hybrid promises to be of great decorative value.

A Belgian horticultural journal, regretting the fact that almost the only creepers used for the ornamentation of houses in Belgium are the Grape-vine, the Ivy and the Honeysuckle, recommends four others as especially desirable. These are the Silk-vine (*Periploca Græca*) of southern Europe and the Orient, a twining shrub of the order Asclepiadæ; the Chinese *Calystegia pubescens*, which belongs to the Convolvulacæ, and is called Bearbind in England, and two of our familiar American creepers, the Dutchman's Pipe (*Aristolochia Siphon*) and the pretty Groundnut (*Apios tuberosa*), which we seldom cultivate, but constantly see growing wild along our woodland fences, with its purplish clusters of vanilla-scented flowers, doubly welcome as they appear late in the summer.

Not many weeks ago the bridge joining Castle Island to the mainland of Marine Park at City Point, in Boston, was completed, and the island was thrown open as a public pleasure-ground. It is twenty-one acres in extent, and, says the *Boston Herald*, on the first Sunday after it was opened it was invaded by many thousands of visitors, who filled it full in every nook and corner. Nothing has as yet been done to give it a park-like aspect, except to burn off its great crops of weeds, leaving the ground for the moment black and bare.

Plans for its adornment are not yet complete, but a drive-way will be carried from the bridge along the shore to a "concourse," which will be built out into the water; a shelter will be built on the point now occupied by the hospital; other desirable buildings will be constructed, and trees in due number will be planted.

According to the *San Francisco Chronicle*, a gourd from Japan is proving valuable for all purposes where a sponge is used. This *Luffa* grows on vines twenty or thirty feet long, and while young it is edible, and when cut up in slices like Okra it is highly prized as a flavoring constituent in soups. When fully grown the interior of the gourd becomes a fibrous spongy mass, and this is separated from the shell and outer flesh by boiling in water to which a large quantity of soda or soap has been added. After being thus treated the resultant fibre is dried, and then takes on a sponge-like appearance. It has been tested in the bath, in the household and in the stable. The hottest water does not injure it. It is very flexible and soft, and it is durable as well. The correspondent who has been making the tests is very enthusiastic over the results, and believes a beginning has been made in what will become a very important industry.

The last number of the *Gardeners' Magazine* contains illustrations of two of the hybrid Sweet-briers which have been obtained by Lord Penzance, one of them, Lucy Bartram, showing finely shaped flowers of an intense crimson, and the other, Alice Bridgworth, being a pleasing shade of rose, while the base of the finely shaped petals is white. The Eglantine has been used both as the seed parent and the pollen parent. When hybrid perpetual Roses are fertilized by the Sweet-brier, the leaves of the resulting hybrid do not have the fragrance of the pollen parent, but in many of the reverse crosses the delicious fragrance of the foliage is retained. Most of the crosses have single flowers, although some of them have two rows of petals. In some cases they have proved perpetual bloomers, and give a fine show of flowers in autumn. Lord Penzance is experimenting with hybrids containing Tea blood, and making crosses of many other kinds, and the results obtained will be looked for with interest by all who love the queen of flowers.

Nicotine, the alkaloid which gives its special qualities to the Tobacco-plant, says Monsieur Jules Rochard, of the French Academy of Medicine, writing recently in the *Revue des Deux Mondes*, was discovered by Poseelt and Remann, and first isolated by Vauquelin in the year 1809. "It is an oleaginous liquid, colorless and transparent, which grows dark and thick when exposed to the air. Its sharp, acrid odor is like that of tobacco; it is burning to the taste, and its vapor is so irritating that breathing is a painful act in a room where even one drop of it has fallen. . . . The different kinds of Tobacco contain it in varying quantities. The black, oily tobacco of the Antilles contains much more of it than the light-colored fragrant tobacco of Levantine countries. Its quantity increases with the development of the plant, and varies according to the tissues of its leaves, thin-leaved plants containing it in smaller amounts than thick-leaved ones. The fermenting process through which tobacco is passed volatilizes the nicotine in part, and thus there is less nicotine in tobacco when it is ready for consumption than there was in the dried but unprepared leaves."

The beautiful model of a typical French farm, which attracted great attention at the Paris Exhibition of 1889, will probably be surpassed next year at Chicago by a "model Washington farm in miniature," which Mr. William L. La Follette, Superintendent of the Agricultural Department in the exhibition of the state of Washington, intends to have prepared. This little reproduction will include "farm-houses, barns, fences and fields of growing grain. There will be fields of summer fallow with tiny gang-plows in the furrows, and threshers, binders and all other farm-machinery will be shown in miniature just as they appear while in use in the far west." Mr. La Follette also proposes to erect a "a large cold-storage safe with glass sides and neatly arranged shelving," in which all the fresh fruits of Washington will be displayed during their seasons. "The collectors in the state will keep a constant supply going to Chicago by fast express. First the safe will be filled with luscious strawberries, and from that on during the succeeding seasons as the fruits ripen the cold-storage display will include all varieties ripening from May 1st to October 30th. This manner of exhibiting fruits," we are told, "will excel anything that can be procured in the way of preserved specimens, although the Commission will have an ample display of all kinds of fruits preserved by the most approved methods."

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLE:—Taste Indoors and Out.....	433
Promising Grasses.....	Professor W. J. Beal. 434
Indian Ridge—An Experiment.....	Mrs. J. H. Robbins. 434
Edible Fruits in the Pines.....	Mrs. Mary Treat. 435
Native Shrubs of California.—VII.....	Professor Edward L. Greene. 436
Notes on the Flora of Smythe County, Virginia.—V.....	Anna Murray Vail. 437
NEW OR LITTLE-KNOWN PLANTS:—A Chinese Peach. (With figure.).....	C. S. S. 438
Dendrobium Phalaenopsis. (With figure.).....	W. Watson. 439
CULTURAL DEPARTMENT:—Water-lilies.....	J. N. Gerard. 439
Choice Hardy Plants.....	R. Cameron. 439
Fall Work.....	W. H. Taplin. 441
Anemone Japonica, Phlox Triomphe du Parc de Neuilly, Clematis paniculata, Funkia subcordata grandiflora.....	T. D. Hatfield. 441
CORRESPONDENCE:—Water-lilies at Yarmouthport.....	T. D. H. 441
Scab-proof Apples.....	Professor L. H. Bailey. 442
The Ten Mile Woods of Hartford.....	Wilhelmina Seliger. 442
Shrubs for a Screen.....	C. B. W. 442
The Skimmia.....	L. D. Davis. 443
RECENT PUBLICATIONS.....	443
NOTES.....	443
ILLUSTRATIONS:—A Chinese Peach, Fig. 72.....	438
Dendrobium Phalaenopsis, Fig. 73.....	440

Taste Indoors and Out.

NOT long ago, in an editorial with the above title, we called attention to the fact that, while the taste of cultivated Americans could be trusted in matters of dress and household adornment, their sense of proportion and appropriateness was not equally developed when it came to the arrangement of their grounds. It was also said that since American men are usually too much occupied to give attention to the planning and planting of their places, it might be well for women to give some serious study to landscape-gardening as an art, so that the surroundings of their houses would be ordered with a taste as sure as that exercised in the selection of a carpet or the hanging of a drapery.

We have received several letters complaining of the rather ungallant statement that hitherto women had not shown themselves great in creating broad landscape-effects, and in a letter from one of our alert correspondents, published two or three weeks ago, we were requested to lay down the fundamental principles of landscape-art, so that studious women might master them thoroughly and avoid in the future such errors as had been complained of. Now, it is impossible to give adequate instruction in landscape-art in "six easy lessons," or to lay down any code of rules which can be adapted to all places and circumstances. Diagrams and planting-plans are useful to illustrate the appropriate or improper treatment of particular places, but they are worse than valueless if they are used like ready-made garments to suit all places which may have any similar features. There are no cast-iron regulations about locating a house or its approaches, or securing the proper proportion and arrangement of grass and shrubs and trees which are to surround it. Perhaps the mistakes which result in spottiness or the grouping together of incongruities do not arise so much from following a bad plan as they do from the fact that the work is done without any plan whatever. The fundamental advice, therefore, to beginners should always

be to have a well-defined plan and then to take no step which is not a clearly justified effort to carry out this design. If it be objected that this counsel is too elementary and obvious to be needed, we reply that so far as our observation goes it is only in rare and exceptional instances that anything like a well-considered plan for the arrangement of private grounds, whether great or small, is studied out and adhered to. Of course, such study should begin with the location and character of the house itself, for no harmonious picture can be developed unless the house and its surroundings are thought out together as a consistent whole. But this having been neglected, the desire for decorating the house surroundings usually manifests itself in the search for beautiful trees, shrubs and flowers. Very plainly it is beginning at the wrong end, and yet it is the almost universal practice to collect a mass of such material as nurserymen's catalogues praise most highly and then wander about the grounds in search of enough open space to hold it all. A composition made in this hurried and haphazard way will hardly have unity, and it will not be likely to satisfy a cultivated taste. When a planter, however, has in mind a clear and vivid picture of the scene he wishes to create, the work of construction is simplified, and his effort to set forth this ideal in lines of living verdure will be a source of constant delight.

But this simple advice to make a plan does not meet the request to furnish a system of rules for guiding the novice in its construction and for directing him how to avoid errors and make the most of his opportunities. This is true. But one who makes an honest effort to work out a design, for all of whose details an intelligent reason can be given,—which shall make a consistent picture, and yet provide adequately for all the comforts and conveniences of a household in the way of buildings, walks, walls and other constructions,—has taken the surest way to acquire a realizing sense of the genuine difficulties of the task before him. Such a one will learn at the outset, even before the questions are settled which decide the essential outlines and framework of the scheme, that there are adjustments and adaptations which baffle his skill. The longer he studies the diagrams of his grounds the more the difficulties will multiply and the more ready he will be to ask specific questions and look for help on definite points. At this stage of progress general directions will not satisfy. The learner does not care to be told that his work should be characterized by breadth or simplicity or restraint. This will not instruct him how he can best keep a proposed lawn-space unbroken and yet make room for a necessary road, or how to provide the best foreground for a superb distant prospect. Suggestive hints can be given about certain kinds of work that will be useful on every place, as, for example, the method of masking house-foundations and connecting the walls with the turf; a few general principles can be stated which should guide in the laying down of roads and paths and matters of that sort, but, after all, each place is a new creation, and must be developed on a motive of its own if it is to have any individual value.

No doubt, the puzzled planner, if he is intelligent and earnest, will soon find himself longing for the counsel of some landscape-gardener of taste and experience, and he will be in a mood to appreciate and follow instructions. This statement is not made for the discouragement of any who have received with attention our original suggestion to give some study to landscape-art. This is the only proper frame of mind for a learner in any art. There will be abundant room for individual suggestion even after expert advice is accepted, and the only way to have an intelligent appreciation of the value of such advice is to give personal study to the problems to be met in any instance. In an early number of this journal (vol. i., p. 3) Mr. Olmsted gave a plan for a small homestead which no one can read without instruction. The specific counsel there laid down may not be available in every given instance, but in a graphic way the treatment of the place calls attention to the class of problems which must be faced whenever a design of any

original value is undertaken, and shows the thorough way in which these problems are solved by an artist with conscience and skill. Since then we have published much to illustrate what we consider good practice and bad in the planning and planting of grounds, and we have added much detailed instruction as to the specific character of various trees, shrubs and vines—that is, the material with which an ideal picture is to be realized in actual scenery. We can think of no better way to help on the novice than by continuing to furnish examples and instruction of the same sort, although well aware that published directions alone will never make an artist. They will realize a worthy purpose, however, if they encourage any one to study these questions for himself, and especially to study nature, where he will be sure to find, if he has a reverent spirit, perfect models and true inspiration.

Promising Grasses.

AT the meeting of the Society for the Promotion of Agricultural Science, held last month in Rochester, Dr. W. J. Beal read a paper entitled "Some Selections of Grasses promising for Field and Lawn." The paper was in the main an instructive record of some experiments made at the Michigan Agricultural College, and our readers will, no doubt, appreciate the practical value of the abstract which follows:

Some seedlings of a glaucous variety of *Elymus Virginicus* were reported to have come very true to the parent plants. When grown for three years beside some of the common or type specimens, they were not only all glaucous, but were more vigorous, averaging one foot higher. This grass is probably not very valuable for fodder, but the point here illustrated is a broad hint to all who are interested in pastures and meadows to be on the alert in selecting forms, varieties or races of grasses which exhibit some merits over others of the same species.

For fifteen years or more Dr. Beal has been raising a selected variety of *Festuca elatior*. The seed came from Kew, England, and seems to be the true variety *arundinacea* of this species. When compared with the type usually grown in this country, the roots are longer and stouter, the culms taller and larger, the leaves much longer, broader, thicker, the panicle more erect and flowering a little later. Plants were exhibited.

Four or five years ago, after careful search, three types of *Poa pratensis* were selected, a very small one with narrow leaves, one of medium size, and a large tall one with very broad leaves. These seedlings come very true to the parents. The smallest one seems best for lawn, the largest for meadows and pastures. A plant of the largest was on exhibition and was three feet and a half high where it had been grown in a crowded condition on stiff clay land.

A better grass to grow in the shade of trees, especially on thin soil for a lawn, is a great desideratum. At the Agricultural College, Michigan, has been such a lawn for twenty-five years or more, seeded with a variety of grasses, among which are several varieties of Sheep's Fescue, probably from Europe. Three years ago Dr. Beal selected pieces of sods from what seemed to be three different plants, all the best for lawn. These have since been grown more extensively. In the original lawn there was much variation and the Fescues were considerably scattered. In such places few of them stuck up in bunches, so disagreeable in a lawn, but most of them had slowly spread till one plant had not infrequently covered a space two feet or more in diameter. A sample of the turf was shown, a foot square, where it had formed a fine light green turf, in a shade so dense and on land so thin and cold that June Grass could scarcely grow at all. The sample was not a dense mat of leaves, such as is seen on good soil in the open sun of a well-tended lawn, but was very satisfactory.

For twelve years or more Bermuda Grass has been spreading more or less in a lawn on sandy land of the Michigan Agricultural College. June Grass, some White Clover and Couch Grass have usually been the mainstays when the weather was favorable, but ten days or two weeks of dry, hot weather have turned the green to brown and yellow. Patches of Crab Grass, Pigeon Grass (*Setaria*) and numerous other dry-weather weeds rendered the surface very unsightly. In several places the Bermuda Grass has spread on the lawn. In spring, and always when the weather is moist and warm enough, June Grass keeps green and makes a fine lawn, the

Bermuda Grass lying low and making little display. On the arrival of a drought, June Grass retires and Bermuda Grass thrives, thus covering the soil throughout the growing season. So far on the college lawn Dr. Beal is much pleased with this experiment of mixing June Grass and Bermuda, but it may not work equally well in some other portions of the northern states.

Indian Ridge—An Experiment.

ONE of the public-spirited men of my acquaintance has been carrying on an experiment in tree-planting and farming on an unpromising lot of about a hundred acres, lying about equidistant from two Massachusetts villages, with the idea that if these towns ever become crowded and flourishing manufacturing centres this estate may some day prove valuable as a country park for both places.

I have found it interesting to observe this place in its various stages during the half-dozen years that it has been under cultivation, and some account of its gradual restoration from barrenness to productiveness may prove of interest also to all those who take an interest in reclaiming waste land.

When the purchaser, whom I will call Mr. X., took up this land it had been well-nigh shorn of its timber. There were some small woods of Birch and Maple, some scattered Junipers, a few good Pine and Oak trees, and a belt of small saplings growing along and in a stretch of low swampy ground that was set down on the old town-maps as Sweet River. Nothing that looked like a stream could, however, be discovered there, its only suggestion was that the water-holes among the peat-bog were a trifle deeper in some places than others.

The first step in the restoration of these waste lands was to provide a protection for these woods from fire, always a menace to outlying timber-land, so in order to form a barrier against the devouring element as well as to drain the marsh it seemed desirable to recover the lost river. An intelligent Irishman was accordingly instructed to re-establish the course of the former stream by trenching, directions being given him to avoid straight lines and to connect the deepest water-holes with something like natural curves.

For two or three summers the ditcher worked away, leaving, at the conclusion of his labor, a winding stream varying from eight to fourteen feet in width, with a dry walk constructed from the peat dug in this manner and thrown on brush, along one edge of it, backed by woods, and on the farther bank a picturesque mass of natural shrubbery full of wild beauty and fragrance. Other trenches connected with this stream rendered the meadow lands available, so that the one job established a good defense from fire, supplied a valuable mass of peat for use upon the high dry uplands, and gave good fields for raising grain or grass, by lowering the general level of the water. This was effected by a system of water-gates permitting the variation of its level at will.

Through the woodlands, for still further protection, the leaves were raked away and trenches cut to help in fighting the flames by isolation, if by chance some of the trees should catch from guns, burning brush on adjoining land, or from the sparks of a locomotive. These precautions are still taken continuously to protect the property from its most dangerous enemy. The next step was to establish nurseries for trees, and to plant them everywhere in great numbers. Mr. X. made the mistake of beginning his plantations with one-year seedlings, which perished in great numbers, but experience taught him that trees somewhat older were of a more satisfactory size to endure drought and the dislodging frosts of a New England climate.

This tract is one of very varied surface, consisting of valley, bog and upland; gravel hills, sand hills, clay hills are all to be found upon it, and in the centre rises an eminence some 125 feet above the sea-level, which commands from its summit a widely extended and beautiful inland view over the neighboring villages as far as the distant hills of Milton.

There is a curious interval in one part of the place, which has been known for the better part of a century as the dry dock, from its resemblance in shape to one of these constructions, the walls being represented by two steep moraines, or, to speak more precisely, kames, evidently the deposit of some break in an ancient glacier. The crest of these Indian ridges, or horsebacks, as they are popularly called, is only wide enough for a foot-path, and they are from two to three hundred feet in length. Their steep slopes are covered with self-sown Junipers. These singular formations are of much geological interest, and as such a double moraine is unknown in this section of the country, this rare phenomenon cannot fail to attract the attention of every scientific observer.

Great Hill is approached from various directions, and its owner has constructed numerous curving roads, one of which leads to its summit, and is planted as an avenue with groups of young trees, and winds among the existing ravines in a way to make use of them effectively. When the present proprietor purchased the property, it was not esteemed valuable, as all the good timber had been cut, and the mossy, arid surface promised nutriment neither for trees nor crops. Mr. X. did not undertake the experiment of reclaiming it for profit, but as an entertainment for himself, as a means of giving employment to people in whom he was interested, and to show what could be done by intelligent management of even so worn-out a region as this. His ultimate aim is to produce a pleasure-ground that may be of public worth in the future, and the whole venture is so public-spirited and so valuable as an object-lesson that it fills the observer with interest.

The gradual transformation from desolation to fertility in this once abandoned spot is a proof that with zeal and energy no part of Massachusetts need go to waste, if people are willing to work intelligently and faithfully for the restoration of its soil. Here, where once all was barrenness, are to be seen fertile fields, reclaimed bogs, neat, well-ordered vegetable-gardens, groups of flourishing young trees, and nurseries wherein others stand ready for transplantation. Where the ground is hilly the moisture runs off, the trees grow slowly, parched by the drying winds and lack of sustenance; but on the level spaces they flourish bravely, and the soil from the bogs helps to feed their roots. In the kindly shelter of light-existing woods the more delicate trees are growing up, their nurses being thinned out as they increase in size. Beeches and Ginkgos, English Walnuts and Paulownia Imperialis flourish under the protection of White Birches, Sweet Gum and Hemlocks, shaded by the kindly Cedars; and an experiment is being made with the Oregon Maple and Acer Colchicum rubrum, which are always planted on the north side of an evergreen.

Pines have been extensively planted all over the place. White, Pitch, Norway, Scotch and Austrian Pines flourish well. European Birches and Sugar Maples are springing up everywhere, alternating with feathery groups of English Larches. Shrubberies also have been set out, where a goodly quantity of beautiful varieties, such as Thunberg's Spiræa and Berberry, Golden Elders and Spiræas, Deutzias, Purple Hazels, Rosa rugosa and Rosa multiflora are mingled with Cornels and Viburnums and many other shrubs. Space, too, is found for the rarer varieties of trees—Golden Elms and Beeches, Cut-leaved Maples, variegated Elms, Golden Hop Hornbeams, Purple Maples in variety, Purple and variegated Beeches, Chinese Cypress, English Alder, Sycamores, Lindens, and numerous others.

The native Junipers are very handsome, and show their usual variety—some dark and blue, feathered like a Cypress, others yellow-green, and more like a Cedar in foliage. Where the swamp was once inaccessible, judicious filling has given access to a pond which is not yet completed, but will add to the beauty of the place, with its irregular outline and overhanging Willows and Maples. The walks about Great Hill are full of variety, whether you climb over the moraines or stroll on the shady hill-sides or mount by the easily winding drive to the very summit to enjoy the view. A visit to the sheep-folds, where the brown-nosed woolly throng come running to be fed, and try to climb the little trees to browse upon such leaves as are just out of their eager reach, is full of amusement. A flock of sheep is always picturesque and entertaining, with its surprised rushes hither and thither, its gentle undulations of closely packed forms, its funny cries of wonder or fright, the merry trotting of the little hoofs, the shy, mistrustful little faces that watch your every motion so carefully. These little beasts are very carefully protected with high fences finished with barbed and netted wire, and with locked gates to shield them from dogs, and they are closely guarded in their passage from run to run, while their folds are strong and dog-proof.

To accommodate the foreman and workmen on this place, which Mr. X. does not himself occupy, he has constructed an immense barn, which, situated at one end of the moraines, has convenient entrances for vehicles on three stories. On one side of this barn two stories serve for a dwelling in continental fashion, and the other affords accommodation for horses, the basement being devoted to sheep and cows. By means of a good system of ventilation, and a series of doors between the house and stable part of this construction, the dwelling is kept free from odors, and is as convenient and comfortable as any farm-house need be, with the added advantage in winter of having everything under one roof, and

entirely under the eye of the farmer and his men, an important thing in an out-of-the-way locality, where depredations might easily take place without attracting attention.

A visit to this barn shows all sorts of modern conveniences and comforts for cattle. Each sheep is furnished with a little rack of his own for his fodder, which he persists in leaving to try his neighbor's, with sheep-like jealousy, lest another should be better provided than he. The spring lambs bring so high a price, if put early enough upon the market, that it makes their raising profitable, though this flock is not very large, numbering about sixty; moreover they are the most efficient means of transforming wild coarse feed into the best manure.

In the course of his experiment, Mr. X. has discovered that raising timber could never be made profitable on land of this kind, from the fact that the original price paid for seedlings, the expense of taking care of them in their infancy, and the interest on the money, added together, would amount to more than the timber would bring in the twenty or thirty years necessary to render it ready for market.

Having, therefore, provided enough trees to furnish an element of beauty for many years to come (the nurseries being still overstocked, in spite of all his planting), Mr. X. has now turned his attention to raising crops that may be valuable while the trees are growing.

The fields are separated by small belts of timber instead of fences, which gives each stretch of open ground the effect of a lawn skirted with forest. Wherever a fine group of trees was found it has been preserved, with its rocks and underbrush, to form a pleasing natural feature in the scene. Many of these fields have been troublesome to clear, and are still rough, but by the aid of top-dressing and such tilling as is possible they raise good crops of Hungarian Millet, Corn, Rye, Alsike Clover and various Grasses. Many of them, however, have been brought into good condition, and the smooth fine curves of the brown soil lying ready for the seed, or the level sheets of vivid green where the winter grain is springing up, agreeably diversify the rolling surface upon which one looks down from the summit of Great Hill.

The stroll along the recovered river is very beautiful, fragrant in July with wild Swamp Honeysuckle and Clethra, and gay with wood-blossoms at all seasons of the year. Water-lilies and other aquatic plants flourish close to the shady banks just out of reach, and the fairest blossoms blow always on the other shore. Lovely Ferns spring in these solitudes, and the Swamp Rose grows tall and shows its pink blossoms and slender leaves above the surrounding herbage. Here and there a glimpse of sunny meadow meets the eye on the other bank of the stream as you cross its tributaries on primitive bridges, and brush away the tangle of verdure from your path. At your side the Swamp Maples grow tall, and birds sing in their branches. As you walk, there is revealed to you what is seldom seen, the lovely heart of a swamp, with its lush vegetation, its dark, cool recesses, its lonely, shadowy nooks where man rarely penetrates. This river-walk, reclaimed from the peat-bog, is one of the most pleasing of the various attractions of the Farm of Indian Ridge.

I have said enough to show that if a need for a park should ever be felt in its region, we have the beginnings of a delightful one here. With open ground for playstead, and ample room for all sorts of amusements in addition to commanding views, it could be easily made a delight for two contiguous towns, from neither of which it is more than a mile away.

Such enterprises as these are valuable to the observer, and promise well for the future of the country.

Hingham, Mass.

M. C. Robbins.

Edible Fruits in the Pines.

SIX months in the year, at least, an abundance of wild fruit can be found in the Pines, some of which is very good in quality. The wild strawberry has an exquisite flavor, and with cultivation the size of the fruit is increased without loss of the delightful aroma. The best berry is borne by *Fragaria Virginiana*, which we readily recognize by its deeply pitted fruit and narrow neck, and the soft silky appressed hairs on the fruiting stems. Other kinds grow here which it is difficult to identify. I think, however, many have escaped from cultivation and are reverting to the original type. The Shad-berry, or June-berry, ripens before the strawberries are gone; they are sweet and rather pleasant to the taste, although they lack character and sprightliness. We often find the two in company—ripe June-berries hanging over strawberries. Wild Raspberries follow these, but neither the black, the so-called white, nor the red varieties have as fine flavor as those which grow farther north. And yet the cultivated Raspberries of southern New Jersey are specially good.

Early in July our low Blackberries or Dewberries ripen, and some of them cannot be surpassed anywhere. They are large, juicy, sweet and of exquisite flavor. The common high Blackberry is at home here, as it is everywhere. The fruit, which ripens in August and September, is plentiful and of excellent quality. We also have the low Sand Blackberry (*Rubus cuneifolius*). The fruit of this species is in perfection a little earlier than that of the tall Blackberry. The berries are shining black, of good size, and of delicate flavor. This species does not extend very far north. It is found only sparingly in the southern part of New York and Pennsylvania, thence extending in sandy districts mostly along the sea-board to Florida. We find, too, the running Swamp Blackberry. The fruit of this species is small and sour, and by no means tempting to the palate, but the vine is evergreen and very ornamental, especially in autumn and winter, when most of the leaves take on their bronze and scarlet hues; others, however, retaining their shining green color throughout the winter season.

Several kinds of Blueberries and Huckleberries grow in the Pines. The earliest is *Vaccinium vacillans*, which is very plentiful in the dry sandy barrens. It is a foot or two in height, and ripens its fruit early in July. The tall Swamp Blueberry (*V. corymbosum*), with its many varieties, is very abundant in the swamps and damp places. The size and quality of the fruit vary greatly. I have sometimes found the berries as large as good-sized cherries on tall bushes in damp woods. These large berries remind me of a fright I experienced some years ago. A party of us were in the woods in Atlantic County, not far from Egg Harbor River. I had wandered away from the rest to a thicket of the largest huckleberries that I had ever seen, nor have I since seen their equal. They were growing on tall bushes far above my head. I was intent on examining and testing the fruit, bending the bushes down and breaking off the twigs here and there, with which to surprise the rest of the party, when on looking up, not more than a hundred yards distant, I saw distinctly a large black bear standing on his hind feet eating huckleberries like myself. Which was the more astonished or frightened, Bruin or I, it would be hard to tell. At all events, he came to his senses sooner than I did, and dashed off through the thicket, making a crashing noise as he went, leaving me almost paralyzed with fear. This incident, occurring in one of the oldest states of the Union, in the very heart of civilization, gives some idea of the extent of the swamps and woodlands that still remain here.

We have another class of Blueberries which differ somewhat from *Vaccinium*. They belong to the genus *Gaylussacia*, and are distinguished from the other species by having ten seeds which are quite large compared with the numerous tiny ones of *Vaccinium*. One of these, *G. dumosa*, is a half-creeping, dwarfish plant, sending up fruiting stems six to eighteen inches in height. It has racemes of very pretty open bell-shaped white flowers, often tinged with pink. The fruit is shining black, of good size, but flat and insipid. The Dangleberry (*G. frondosa*) is very abundant. The fruit is blue, with a white bloom. It is sweet and is usually found in market mixed with the Swamp Blueberry (*Vaccinium*). The black Blueberry (*G. resinosa*) is also abundant. This is more of a dwarf species than *G. frondosa*, and the fruit is black, without bloom, and has a more delicious flavor than the former. We sometimes find a form of this with handsome white berries, one side with a pink tinge. The Cranberry is found in most of the bogs, and in some places is quite plentiful.

The Chokeberry (*Pyrus arbutifolia*) is everywhere in damp places. The fruit is red, sometimes bluish; it ripens in August, but is not very good. The Beach-plum is also found here. The fruit, though it varies greatly both in size and quality, is better than the Chokeberry. Some of the plums are scarcely worth the gathering, while others are large and luscious, and most tempting to the thirsty passer-by. The bushes never attain the size of even a small tree. The Wild Cherry assumes such fine proportions as to make a handsome ornamental tree, and its fruit, while not to be despised by human mortals, is a constant source of temptation to the birds. I have planted several Cherry-trees and some of White Mulberry for the sole use of my feathered friends.

Wild Grapes are numerous, and the Summer Grape (*Vitis æstivalis*) makes excellent jelly and wine. The Frost Grape (*V. cordifolia*) is quite palatable after frost. The Persimmon forms thickets in many places. The fruit usually ripens after frost, though I have occasionally found trees with fully ripened fruit before frost. When ripe it is orange-yellow, soft and sweet, and relished by many.

Crab-apples of poor quality we find scattered about. If we had nothing better they could be utilized in making jellies and preserves. The Prickly Pear grows in the dry Pines. The

fruit is edible, and will make nice-looking jelly. The barbed prickles with which the plant is armed are annoying to one who gathers the fruit, and I cannot recommend it in the face of so many small fruits which are greatly superior for household purposes. The aromatic Wintergreen is everywhere in the damp Pines, and in the autumn it gives employment to many poor people, especially Italians, who gather the fruit for market.

Vineland, N. J.

Mary Treat.

Native Shrubs of California.—VII.

ONE of the delightful unfading pictures in our memory of eastern woods in their June glory is that of the shrub or small tree known as Flowering Dogwood (*Cornus florida*). A full-grown specimen, with its widespread and stratified branches, each ultimate twig bearing a large white cruciform involucre which commonly passes for a corolla, is an object of striking beauty in the forest-glades where it occurs. *C. florida* was one of the earliest of American shrubs to find a place in the parks and shrubberies of Europe; several varieties, one with red floral bracts, and another with drooping branches, are now generally offered by nurserymen at home and abroad.

We have in California a second species of Flowering Dogwood, *C. Nuttallii*, Audubon (*Birds*, 467). This is superior to the eastern species, at least in point of size and speciousness. Though commonly enough a shrub of fifteen or twenty feet in height, *C. Nuttallii* is sometimes a tree of fifty or sixty feet; its white floral bracts, not rarely two or three inches long, are in sixes, not fours, and the whorl, or "flower," is therefore five or six inches broad, and circular rather than cruciform. The oldest trees do not, to my knowledge, present that stratified arrangement of branches, as I have called it, which marks the eastern species; but at all stages of development its head is more compact and massive; moreover, the flowers are not borne in the same profusion as in the older eastern trees. *C. Nuttallii* is, nevertheless, really one of the beauties of the forest in several sections of California and Oregon. Late in April of the current year, while passing along the elevated mountain-road between Knight's Valley and Lakeport, near the summit of a ridge leading up to Mount St. Helena, on rounding an abrupt bend in the road which brought me at once from the dry southward to the cool moist northward slope, I was brought to a sudden halt, struck with wondering admiration as I saw before me a half-dozen fine young trees of this species in full bloom. And, as if to intensify the happy impression of an old-time woodland scene in New England, I found, as I came near the trees, the ground beneath them half-covered with the ample spotted foliage of one of our western *Erythroniums*, *E. giganteum*, a plant as much larger than the eastern Dogtooth Violet as the western Dogwood is larger than the New England tree, the flower-stalk supporting from three to six pale yellowish or almost white blossoms.

This Dogwood is said to have been formerly indigenous to the San Francisco peninsula. If this is true, no specimens have been allowed to remain, though few of our native shrubs could be more worthy of preservation for ornamental purposes. A group of these planted in our Golden Gate Park, or a single one of them in any private shrubbery, would elicit praise from all admirers of beautiful trees if seen in flower, while even the fruit, a close globose cluster of scarlet berries, coming on late in summer, is singularly attractive.

The brilliancy of Poppies has been appreciated in many parts of the world from immemorial ages; and not until after the discovery of California were any shrubby genera of this family known. *Romneya*, with its fine sea-green foliage and enormous white flowers, is now familiarly known and much admired both at home and abroad. I like quite as well our other shrub Poppy, the *Dendromecon*. This has not yet been added to the list of cultivated shrubs in even our own country, though its merits were recognized in Europe as soon as the first pressed specimens for the herbarium had been seen there. The flowers of this are yellow, and resemble those of the *Eschscholtzia*, but the foliage is entirely different, being narrow and willow-like, and clothing all parts of the bush up to the base of the slender flower-stalks.

One of the prettiest contrasts, in a floral way, which the Coast-range landscapes afford, is seen where, as on Mount Tamalpais, long stretches of bushy slope exhibit a commingling of the intense blue of a small *Ceanothus* and the rich yellow of the *Dendromecon*.

All our native shrubs, in so far as they have been made the subjects of such experiment, respond quickly to the cultivator's efforts, in an increased luxuriance of foliage and greater profusion of bloom, and I am confident that any one who

might succeed in propagating our neat yellow-flowered shrub Poppy, and introducing it at home and abroad, would have done floriculture a great favor. A demand for this, equal to that which has been created for its more pretentious ally, Romneya, would surely follow. The seeds of *Dendromecon*, like those of Romneya, probably require a long time to germinate. From seeds sent to England by David Douglas sixty years ago a few plants were produced, all of which are said to have been killed by the severe winter of 1837-8. I think that no subsequent attempts at cultivating it have been successful there, if, indeed, any have been made. In California I have never been able to record the germination of a single seed, whether sown in garden or greenhouse.

University of California.

Edward L. Greene.

Notes on the Flora of Smythe County, Virginia.—V.

THE aspect of the country north of Marion was strangely different from that of the district on the North Carolina border. Walker Mountain, the first range of hills on the left bank of the Middle Fork of the Holston, a straight, level, almost unbroken mountain-range, is covered with a young forest, which, though hardly as beautiful as the wilder ones across the river, was not, however, lacking in interest. Innumerable little brooks danced and sparkled down through the dells and valleys, each of which had more or less distinct features, and often a flora of its own. This was especially marked in the cryptogamic collection that we made. Sometimes a tiny Moss or Liverwort would grow on the stones of a little water-course, which, even with careful search, could not be found elsewhere. One quite large stream, in spite of its odd name, Hungry's Mother Creek, was a very attractive feature in the landscape, flowing between tall cliffs and broad meadowlands, the cliffs covered with a luxuriant growth of Ferns, and the meadowlands filled with tall Grasses and Sedges and bordered with high tangles of superb Blackberry-vines, the flowers of some of which were remarkable for their strong resemblance to Apple-blossoms. They were very large, with the outer surface of the white petals a bright rosy pink. In one of the meadows we found the tall pale lilac-blue spikes of the Wild Hyacinth, or Eastern Camass (*Camassia Fraseri*), and along the shady hedges the very local *Hydrastis Canadensis*, a plant with a coarse broad leaf and very inconspicuous flowers and fruit, grew with quantities of *Polemonium reptans* for its companion.

On the rather barren mountain beyond we found an interesting form of the Dwarf Thorn (*Crataegus parvifolia*) not more than four feet high, with thick bright green glossy leaves; the rather large white flowers growing in clusters of two and three, and remarkable for the multiplicity of their petals, some of them having as many as fifteen. Higher on the mountain *Crataegus coccinea* grew in great abundance, and with it its so-called variety, *macracantha*, the leaves of which are broader and darker than those of the type, and having apparently a more spreading habit of the branches. *Pinus pungens*, the Tablemountain Pine, covered with its many generations of large cones, was occasionally seen, but the Scrub Pine (*P. inops*) was the common Pine of the range. In the woods *Euphorbia corollata* was just coming into bloom, and *Ligustrina actæifolium*, a coarse umbelliferous plant, grew side by side with some very tall and beautiful Meadow Rue (*Thalictrum purpurascens*).

The golden *Coreopsis senifolia*, var. *stellata*, was seen scattered in small groups, a most effective plant. *Aletris farinosa* was with it, though not in abundance. *Galax aphylla* covered the ground in places, and was always pretty with its light green glossy leaves and slender white spikes. Near the top of the mountain, clumps of *Tephrosia Virginiana*, with yellowish, pink and purple pea-like flowers, were conspicuous. The bare reddish sandstone ledges on the top of the mountain were decorated with innumerable pretty white stars of a Saxifrage and quantities of Ferns and many Grasses. *Hydrangea arborescens* was flowering, its broad white cymes having somewhat the aspect of those of *Viburnum lantanoides*, though the flowers were by no means so handsome nor so large. *Heuchera pubescens* was with the Saxifrage on the rocks, and along the banks of the road which descended into the valleys of the North Fork of the Holston River we passed through great hedges of the pretty pink-belled *Apocynum androsæmifolium*. In the woods three Milkweeds were in bloom—the greenish Poke Milkweed (*Asclepias phytolaccoides*), *A. variegata*, a handsome plant with white flowers, and *A. obtusifolia*, with rather dull purple and greenish flowers. Near the river and in open fields the gorgeous Butterfly-weed (*A. tuberosa*) made brilliant orange spots in the landscape. The shallow borders of the river were filled with the Water Willow (*Dianthera*

Americana), a slender erect plant with long narrow leaves and purple and white spotted flowers. Some very fine specimens of the Ash-leaved Maple, then in fruit, grew along the water's edge, and in the open fields, struggling through the short grass, we found the small *Galium Anglicum*, an introduced and very diminutive species, scarcely more than two inches high.

North of Saltville, in the Holston valley, the two nearest and highest elevations are White Rock and Red Rock, presumably named from the color of the perpendicular cliffs that crown their summits. The excessive heat rendered the ascent of White Top, the loftier of the two peaks, a somewhat formidable undertaking. The road followed a narrow rocky water-course for a mile or two through woods and along open clearings, where thousands of Chinquapin (*Castanea pumila*) made the atmosphere almost stifling with the far from pleasant odor of their flowers. On some of the ledges we found the graceful, drooping flowers of *Dicentra eximia* and very large spreading plants of *Arabis lyrata*.

Most interesting at that altitude and so far inland was a small grove of Holly (*Ilex opaca*). The shrubs were quite high and very handsome. The American Mistletoe (*Phoradendron flavescens*) was noticed on some very tall trees, but was totally inaccessible. When the road grew too narrow for travel we left our wagon and climbed the long steep ascent which wound through ravines and woods till it reached a clearing hidden in a shallow hollow of the great mountain. Two small cabins, surrounded by poorly cultivated Rye and Corn fields and savoring strongly of the moonshiner's retreat, stood under the shadow of a few giant Tulip and Chestnut trees. Other trees still larger lying on the ground told a tale of the grandeur of the past forest, the prostrate trunks surpassing in size any that we had previously seen. From that point our path was a hardly visible trail through underbrush and young woods with interesting and often familiar plants all around us. On damp ground we found the blue-flowered *Phacelia* (*P. bipinnatifida*), a plant having less beauty, however, than the other two species, *P. Purshii* and *P. fimbriata*. One of the commonest of the smaller flowers through the county was *Houstonia purpurea*. Everywhere it bloomed, a delicate pinkish purple, but in the White Rock Woods we found it pure white. *Hydrophyllum macrophyllum* and *H. Canadense* were growing together, and open fields below the cliffs were purple with a *Pentstemon* that we were not able to name with the literature at hand. Our literature failed us, too, with a large, very showy *Rudbeckia* that was beginning to fill the woods with yellow. A few early specimens of the red *Lilium Grayi* were collected, and innumerable buds just ready to open promised a gorgeous sight a few days later. *Clematis Viorna* grew up there taller and with larger flowers than any before seen, its pink-purple bells being much more than an inch long and broad in proportion. The large blue Spiderwort (*Tradescantia Virginica*) was scattered everywhere, and *Vicia Cracca*, a pretty little Leguminous vine, climbed over the taller herbs.

The last part of the climb was up the precipitous cliffs that formed a sheer barrier along the summit of the mountain. The rocks were covered with a white Lichen, the color of which could be seen miles off from the valleys, giving its name to the mountain. From the top the view in all directions was magnificent. Southward we counted eight ranges of tree-covered mountains, White Top and Mount Roger towering above all, while a dim vision of the great masses of Grandfather and the Roan faded into the distant horizon.

The mountain sloped gradually into the valley beyond, and the whole summit was a flower-show of the most brilliant description. Without leaving the highest point of the rock we could see many acres of Flame-colored Azaleas (*Rhododendron calendulaceum*) in full bloom. They were not more than three to five feet in height, but were unsurpassed in color. Every shade and gradation of yellow, orange, scarlet and crimson were represented in all their infinite variety. *Amianthium muscætoxicum*, a tall, slender liliaceous plant, with spikes of white flowers, grew among the Azaleas. It was interesting to find many of the earlier-blossoming plants still flowering at that altitude. A few *Kalmias* were still seen; *Pyrus nigra* was abundant, and so was the tiny flowered *Ilex monticola*, as well as a low form of *Andromeda ligustrina*, that was covered with small white bells.

The long valleys around Saltville were more remarkable for their large stock-farms and cultivated fields than for botanical purposes, so on our return from White Rock we did not linger, but retraced our steps across the Walker Mountain to the Marion valley. Our time there was limited, and we were obliged to return east without seeing the wealth of summer and autumn vegetation, the coming glory of which was

already prophesied along every road-side and in every field.

The mountains of the south-western portion of Virginia, as well as those farther south and west, are yearly becoming more accessible to travelers, and their great charm and beauty are sure, before long, to make the tide of spring and summer travel turn in their direction. Away from the railroads, accommodations are scarce and usually of the most primitive description, but beauty of scenery, superb views and the intense quiet of the great forests make up to a degree for the lack of luxury.

The mountaineers were invariably civil and hospitable, and readily shared their simple fare with us. Even the suspicious moonshiner would travel out of his way to show us a short cut. Great was the interest shown in our strange employment, and speculations were rife as to our reasons for wishing to carry away the useless weeds which grew in such profusion along the slopes of every hill.

New York.

Anna Murray Vail.

January, produced vigorous plants, which began to flower in 1886, and have flowered profusely ever since. The flowers are large and dark-colored, but not larger, or of a deeper shade, than those of many cultivated Peach-trees. The fruit is free-stoned, rather thick-skinned, with white juicy flesh; it has a fair flavor and good size, as is shown in the illustration on this page from a drawing made in the Arboretum by Mr. Faxon. The fruit, however, is not remarkable in quality, although rather better than the average, nor is it remarkable in size, and the only peculiarity of this variety which deserves attention is its great vigor and hardiness. The flower-buds of the Peach-tree are often killed in this latitude; and in eastern New England the peach-crop is very uncertain, the trees rarely producing more than one crop of fruit in four or five years. But up to the present time the flower-buds of this Chinese variety have



Fig. 72.—A Chinese Peach.

New or Little-known Plants.

A Chinese Peach.

IN the autumn of 1879 Dr. Bretschneider, the distinguished botanist and Chinese scholar, and at that time an attaché of the Russian Legation at Peking, sent to the Arnold Arboretum the seeds of a number of trees and shrubs gathered on the mountains near the Chinese capital. Among them was a package of peach-stones labeled "Cultivated Peach, growing wild." These seeds, planted in the following

never been known to suffer, and year after year the branches are covered with flowers and abundant crops of fruit. Here, then, perhaps, is a variety from which seedlings can be raised which will be as hardy as the parent, and which, by careful selection, will produce in time fruit of first-rate quality, or which can be used by the hybridizer to give vigor and hardiness to a new race of exceptionally hardy Peaches. The quality of the fruit is already good enough to justify the effort to improve it; and the trees in the Arboretum offer to pomologists of cold climates the op-

portunity to extend northward the territory in which the Peach can be successfully and profitably grown.

This Pekin variety is of interest, too, as a probably direct Chinese descendant of the wild Peach, which is now believed to have come originally from northern China, whence it was early transported by the way of India into Persia and other countries of the Orient, and then into Europe and North America.

C. S. S.

Dendrobium Phalænopsis.

THE figure on page 440 was prepared from a good variety of this beautiful *Dendrobium*, now in flower at Kew. The plant is one of the large number imported by Messrs. F. Sander & Co. from New Guinea last year, and sold by auction. A full account of this species will be found in volume iv. of GARDEN AND FOREST, page 521, written immediately after the sale of these plants. Since then this Orchid has gone forward in popular favor. It is not only the best of the Australian *Dendrobiums*, but it is one of the very best of the several hundred species known. The only correction I would like to make in the account published last year is in the statement that Reichenbach was responsible for the varietal name, *Schroederianum*. On inquiry I learn from Messrs. J. Veitch & Son, Chelsea, that the plant thus named was imported by them and sold to Baron Schroeder. It was the finest form of *D. Phalænopsis* known prior to the importation of Messrs. Sander & Co., and, no doubt, the name was given when it flowered in the Baron's collection to distinguish it from the plant flowered at Kew and figured in the *Botanical Magazine*, t. 6817, which has shorter pseudo-bulbs and smaller flowers, much paler in color than those of Baron Schroeder's plant. The statement made recently in *Reichenbachia*, that all the plants, including that of Baron Schroeder, were offshoots from the plant flowered at Kew, is therefore incorrect, as, indeed, a comparison of the figure in the *Botanical Magazine* with that of Baron Schroeder's plant, published in *Reichenbachia*, conclusively shows. No doubt, the newly imported plants were designated by the varietal name for trade purposes, but now that so many forms both in regard to size of pseudo-bulb and flower as well as color are known, the name *Schroederianum* may conveniently be dropped.

The plant figured here has pseudo-bulbs a yard high and as thick as a man's thumb. The flowers are three inches across and colored mauve-purple, with a deep maroon-purple labellum. The oldest flowers have been expanded a month, and they are still fresh.

For its cultivation *D. Phalænopsis* requires the hottest and moistest stove, and it grows best when placed in a position close to the roof-glass. Messrs. Sander & Co. recommend for it the treatment of the Pine-stove, or such as suits *Crotons* and *Ixoras*. The Kew plants are grown in baskets, and are planted in peat-fibre and sphagnum. They are liberally watered and syringed overhead when in growth, and are kept moderately dry after the growth is matured. It may be stated in proof of the good nature of this *Dendrobium* under cultivation that the plant sent to Kew by Mr. Forbes ten years ago is still in good health, and has flowered this year.

London.

W. Watson.

Cultural Department.

Water-lilies.

POND-LILIES have always been popular flowers, and their cultivation in natural and artificial basins is by no means new, but their ornamental capabilities have been appreciated for comparatively few years. Though grown for a long time in botanical collections, their decorative value seems to have been first realized by Mr. E. D. Sturtevant, who less than twenty years ago began to impart his enthusiasm for the plant to others and started the movement which has resulted in the present interest in aquatic plants in this country. Many grand varieties were then in existence, but they were not of a char-

acter to appeal to the general garden public, being mainly tender kinds, or supposedly tender, as in the case of *Nelumbium speciosum*, needing special care and facilities possessed by few growers. Of hardy White *Nymphæas*, there was a fair number of varieties, but the discovery of the red sport of *N. odorata* on Cape Cod, and the introduction of a red variety of *N. alba*, from Lake Fayer, in Sweden, after a few years quickened the interest very materially. About the same time Mrs. Mary Treat discovered the half-hardy *N. flava*, which had first been made known by the brush of Audubon. And at last we had a collection of hardy varieties from which, under the quickening hand of the hybridist, there have been produced new varieties of the greatest interest and merit.

Mons. B. Latour Marliac has especially distinguished himself in this line, his *N. chromatella*, introduced in 1887, being, with *N. sulphurea*, introduced about the same time, the first of a series of fine varieties as yet unsurpassed in shades of yellow and pinks. They appear to be mostly hybrids of some form of *N. alba*, and in the case of the yellows, either *N. flava* or *N. Mexicana*. One of the newer ones, *N. helveola*, is a beautiful yellow, while the newest variety, *N. Laydekeri*, is apparently a cross between *N. pygmaea* and *N. Sphærocarpa*, the Swedish Lily, showing the peculiar color at one stage which characterizes the latter variety. The Swedish *Nymphæa* is one of my failures, it declining to move for me, but from information received from correspondents I am inclined to believe that the peculiar changes of coloring of *N. Laydekeri* in the different stages of the flowers is a peculiarity inherited from *N. alba rosea*. The new pink *Nymphæas* have, I think, all been described in GARDEN AND FOREST during the season, and it will suffice to say that there is at present available a whole gamut of tones, from faintest blush to light carmine. But there is evidently a number of important additions to come, if I may judge from the flowers sent me during the season. After a little experience in growing pink *Nymphæas* in different soils and different seasons it has been impressed on me that one can speak of them only as they average, and that caution is required in describing the color of varieties from slight material. From Mr. Sturtevant I have had fine flowers of a new variety, a bold solid flower with broad petals and a very clear, uniform suffusion of pink of a delicate shade. There came from Dr. H. T. Bahnsen a flower of similar character with a tinge of salmon. Both of these are very promising. Monsieur Marliac has two new *Nymphæas* which he claims are hybrids of *N. chromatella* fertilized by *N. rubra* of India. As they are said to be as hardy as *N. chromatella*, with deep carmine flowers of the largest size, they will add a new zest to water-gardens next season. From William Tricker there comes a new hybrid tender *Nymphæa*, evidently *N. dentata*, colored by *N. rubra*, which gives a new night-blooming variety with the bold loose habit of *N. dentata*, of a light rose shade, which should light up well. As a friend says, the possibilities of hybridization among the *Nymphæas* seem infinite, and constant accessions of new and desirable hybrids may be expected to crowd our collections.

Elizabeth, N. J.

J. N. Gerard.

Choice Hardy Plants.

FROM early spring until late in the fall, our herbaceous borders are made bright and attractive with some species of the Speedwell family. In the early summer a large number of the European species are in bloom. *Veronica longifolia subsessilis* is beautiful at this time. In my estimation it is the best of all the hardy *Veronicas*, and deserves a prominent place in our borders. This Speedwell was introduced from Japan in 1878; it is quite hardy, easily propagated, and has large, conspicuous racemes of blue flowers. It is scarce, and not often enough seen in collections of hardy plants. It grows from two to four feet high; its serrated leaves are from three to four inches long and a deep dark color. The flowers are of the deepest blue and are produced freely in large dense racemes. The plant has good habit and is easily increased by division of the roots early in the spring or late in the fall. It thrives best in a good, deep, rich soil, and prefers an open situation. This is altogether a good perennial and deserves a place with our choicest hardy plants.

Young plants of *V. longifolia*, raised from seeds sown last spring, are blooming profusely now, and the long racemes of blue flowers are very effective. Although this is the most common species in gardens, it is, nevertheless, a handsome border-plant, and grows and flowers freely in any good soil. Another Speedwell in bloom is *V. Virginica*, the large Virginian Speedwell. In color, its flowers are not as pleasing as those

already described, but it is a bold and stately plant and well deserves a place in our gardens. The plants in bloom here are between four and five feet high, and the lanceolate, serrated leaves are produced in whorls along the stems. The flowers are arranged in long panicles and are of a whitish color. It is a free-growing plant and likes good, rich soil.

Sedum spectabile is grown in the herbaceous border in large clumps two feet across, and the clumps are planted about four yards apart. This method of planting is very effective, and will give a display for five or six weeks. This is one of the best of the tall-growing Sedums we have; it stands drought well, is a good bloomer, quite hardy, and is never much attacked by insects. It throws up erect stems about eighteen inches high which are furnished with broad glaucous leaves. Even before the plant blooms it is conspicuous for its showy glaucous leaves. The large massive heads of small rosy flowers, which are arranged in cymes from five to seven inches across, are very attractive and are noticeable from a distance. The plant will grow and flower in the shade, but for perfection it requires to be planted where it will have the full benefit of the sun. It will grow rapidly if planted in good rich soil, and is easily propagated by division of the crowns in spring. It is a native of Japan. Another good Stonecrop in bloom is *S. Ewersii Turkestanicum*. It belongs to the evergreen class of Stonecrops, and is a neat dwarf plant, somewhat like *S. Sieboldii*, but more compact in habit. It is quite hardy and an excellent rock plant. The long, prostrate stems are covered with smooth glaucous leaves, about an inch across; the lower leaves are elliptic and the upper ones heart-shaped. The flowers are dark red-purple and are produced in terminal corymbs. It is easily increased by division or by sowing seed early in the spring. The species of which this plant is a variety is a native of Siberia. The plants in bloom here were raised two years ago from seed obtained from Mr. Thomson, Ipswich, England.

Plumbago Larpentæ has been in bloom for more than a month, and will keep on producing its violet flowers until frost comes. It was introduced into England from China in 1846, and was grown in greenhouses before it was known to be hardy. When this plant first flowered in England, a year after it was introduced, a small plant with three or four blossoms was shown at a meeting of the Horticultural Society by Lady Larpent's gardener, and was awarded a prize. The judges at once saw the good qualities of this *Plumbago*, and declared that it would become a good bedding plant. Soon after this it was found to be quite hardy, and *P. Larpentæ* was soon generally grown. Plants in our rock-garden have stood for several years, and produce annually an abundance of beautiful flowers. *P. Larpentæ* is dwarf, with prostrate wiry stems about a foot long, covered with leaves about two inches in length. The flowers are produced in trusses at the ends of the slender shoots and are an intense violet color. It does best in a raised position in the

rock-garden, where there is plenty of light and sun. It is easily increased by division, either in spring or fall.

Balamacanda Chinensis, better known in gardens under the generic name *Pardanthus*, is quite hardy and grows into large plants here without any protection. It is a herbaceous plant, growing about three feet high, with root-stock and foliage like an Iris. The flowers are orange-yellow, and mottled above with crimson-purple spots. They are rather fugitive, but, as they are produced abundantly, the plants are at no time without



Fig. 73.—*Dendrobium Phalaenopsis*. Half natural size.—See page 439.

flowers during their blooming season. It thrives best in a rich sandy soil and in a situation where it can get plenty of light. Seeds are produced abundantly, and these germinate quickly after they are sown. On a recent visit to a nursery near by I saw thousands of these plants, raised from seed sown last spring.

In the back row of the herbaceous border, the most showy plant is *Rudbeckia subtomentosa*. Without a doubt, of all the tall-growing *Rudbeckias*, this is the most compact plant

and the best for our borders. It is not too tall. The stout stems, with their ovate-lanceolate leaves, rise to a height of four or five feet and are branched at the top. On these small branches the bright yellow flowers are produced in large numbers. It is found wild in the western states, growing on the prairies and in open moist grounds. It grows best here in deep, stiff soil and away from the shade of trees.

Botanic Garden, Cambridge, Mass.

R. Cameron.

Fall Work.

THE potting of various bulbs for winter and spring flowering should now be attended to. Among these are *Lilium longiflorum* and *L. Harrisii*, the latter being the more easy to force early in the season, though for early forcing medium-sized bulbs are preferable, and Bermuda-grown stock is usually superior to that cultivated in this country. The best soil to use is a light rich loam, with a liberal addition of good manure. The bulbs should be potted quite firmly, and at least one inch below the surface, as the stems will send out roots above the bulbs if they are planted deep enough, and the bulbs should be placed at once in the pots where they are to bloom. After potting it is best to place these Lilies out in a cold frame until they are well rooted. During this period I prefer to cover them with shaded sashes instead of burying the pots in soil or ashes, which tends to weaken the growth.

Tulips, Hyacinths, Narcissi, Freesias and other Dutch bulbs will soon be received. With all these root-action must be secured before the tops are forced into growth, or the flower-spikes will be weak. *Gladiolus Colvillei* should be included in the list of bulbs for winter and spring. Its handsome spikes are a very acceptable addition to the stock of flowers for cutting.

Quite an industry has been established of late years in the growing of seeds and bulbs in California for the eastern market. Among these are *Calla* bulbs of excellent quality, furnished at reasonable prices. Some of these may well be included in the fall bulb order, as the California bulbs seem more floriferous than the home-grown article, possibly because they are more thoroughly matured. A few bulbs of *Amaryllis aurica* will also prove a satisfactory investment. Their bright flowers are a pleasing addition to the conservatory, and no special nursing is required to induce free and vigorous growth.

The removal of tender plants from the flower-beds will soon be necessary, at least in northern latitudes, and cuttings should be secured of *Geraniums*, special varieties of *Verbenas*, *Coleus* and other soft-wooded plants, to make sure of some of them before an unexpected frost arrives. The compost-heap must be prepared before the ground becomes soaked by the fall rains, and it is better to attend to this matter during the summer months, when the soil is in the best condition.

The lifting of *Carnations* and *Chrysanthemums* planted out-doors may be done whenever the weather is favorable, if possible, during dull weather. The plants will then suffer very little, though, like many other simple operations, much depends on the after care. I have seen *Carnations* transplanted when the ground was so dry that it was impossible to lift a ball of earth with them, and yet by careful treatment the plants did well, while others, lifted under the most favorable conditions, failed from lack of thorough watering in and frequent syringing overhead for the first few days. *Bouvardias* should also be lifted soon, and may be either potted or planted on a bench, the latter system usually inducing the strongest growth and greater quantity of flowers.

Holmesburg, Pa.

W. H. Taplin.

Anemone Japonica.—Too much cannot be said in favor of this Japanese *Anemone* for piazza decoration, grown in pots. It is very easy to grow, and can be stored in a cold cellar in winter. To have flowers in August it is necessary to start the plants in a cold frame in March, and to plunge them in the open ground after danger from frost in May. When the plants show their flowering stems in July a little liquid manure will strengthen them.

Phlox Triomphe du Parc de Neuilly is the brightest and best of all the scarlet shades of herbaceous *Phloxes*. For two seasons I have saved seeds and raised about one hundred seedlings from this variety, but not one in any way resembled the parent, although they were very beautiful.

Clematis paniculata will be in magnificent bloom here by the 12th of September, and no doubt it is in full flower already in the latitude of New York. This is one of the best species ever introduced, and seems free from disease. It has, moreover, a very sweet hawthorn fragrance.

Funkia subcordata grandiflora.—This beautiful Day Lily is grand when it succeeds well, as it does with us. Plants in partial shade do better than those in the full sun. It is perfectly hardy, but suffers in sunny places from alternate thawing and freezing in spring. The young leaves are also very liable to injury from late spring frosts. I saw a magnificent clump a few days ago, and I should think it could be very effectively used for massing in public parks. Prior to the blooming season its handsome foliage is very effective.

Wellesley, Mass.

T. D. Hatfield.

Correspondence.

Water-lilies at Yarmouthport.

To the Editor of GARDEN AND FOREST:

Sir,—For many years Water-lilies have been a special feature in the gardens of John Simpkins, Esq., of Yarmouthport, Massachusetts, and representatives from all parts of the world are found here in one or the other of the three spacious tanks. The newer hybrids and varieties are grown and tested as soon as sent out. For one interested in *Nymphæas* no better opportunity for studying them can be found than this collection offers, and no more willing or capable guide than Mr. Brydon, the gardener of the establishment.

Nymphæas may very conveniently be divided into day-bloomers and night-bloomers. Among the tropical and sub-tropical species and varieties (all of which are bulbous-rooted), *N. gigantea*, introduced from Australia as long ago as 1852, is one of the handsomest and best of those which bloom by day. It is comparatively rare, principally on account of the difficulty of keeping it over. It is also very impatient of being disturbed, especially when small, and until well established it is liable to go to rest, forming a poor bulb, or a number of small ones. The flowers are violet-blue, with a deeper border along each petal, sometimes measuring ten inches in diameter, and standing boldly out of the water. The flower is, unfortunately, inodorous. *N. Sturtevanti*, said to be a chance seedling from *N. Devoniensis*, is remarkable for its handsome reddish brown leaves. The flowers resemble those of *N. Devoniensis*, but are more double, the multiplicity of petals giving them an incurved form, and one fully open measured twelve inches in diameter. *N. stellata Zanzibarensis*, introduced as recently as 1880, is a well-known sweet-scented day-bloomer, and produces an abundance of large flowers of the deepest blue. The typical variety is a long time opening its flowers, and opens them later in the day than do its seedlings, many of which are very handsome, and range in color from blue to pink and purple. *Azurea* and *Rosea* are named varieties of this species. *N. Lotus dentata* is a variety with chalk-white flowers of the well-known Egyptian *Lotus*. It is a night-bloomer, and the flowers are star-shaped. *N. Devoniensis*, a garden variety, originated at Chatsworth, England, is one of the brightest and best. Its bright red flowers are produced out-of-doors until very late in the autumn, and with the protection of a greenhouse it will bloom all through the winter.

Of the newer hardy, or nearly hardy, species and varieties, all of which are day-bloomers, Dr. Bahnsen's *Nymphæa Carolinensis* deserves to rank with the best. It is a supposed natural hybrid, with a rhizomatous root like the common *N. odorata*. The flowers often measure seven inches across, of a light pink when they open, and changing to white. *N. alba candidissima* is a splendid variety of the common European *N. alba*. It is sometimes confounded with the American *N. tuberosa*, but is quite distinct in that its flowers are more double, a purer white, and it possesses a running rhizome. Some of the dwarfer kinds are very pretty and interesting, especially in showing the wide range of form in the genus and in giving a certain completeness to a collection. *N. Mexicana* is a dwarf and pretty free-flowering yellow species, and very fragrant. It resembles *N. flava* somewhat, but the flowers are larger and stand more clearly out of the water. Mr. Brydon is of opinion that this species, instead of *N. flava*, is one of the parents of *N. sulphurea* of Marliac. *N. sulphurea* possesses many of the characteristics of *N. Mexicana*, especially in the long petals, the longer rhizome, and the habit of the flowers, which stand clear above the water. *N. pygmæa* is a neat little central Asian species introduced into Europe in 1805. It is white-flowered and very fragrant, and, according to Mr. Sturtevant (*American Florist*, August 18, 1892), is one of the parents of Marliac's *N. Helveola*, and *N. flava* the other. *N. Helveola* resembles *N. Mexicana*, but the flowers are shorter and less double.

Many of Marliac's new varieties have proved equal to his representation. *N. exquisita*, evidently related to *N. odorata*, is

one of the best pink-colored hardy varieties grown. *N. carnea* is a light pink. *N. rosea*, with flowers seven or eight inches across, a lovely shade of pink, has also very handsome foliage. *N. albida* is a splendid white. The flower is better than that of the variety *Candidissima*, but Mr. Brydon says it is not so satisfactory to grow.

A disease which, unfortunately, disfigures the leaves has attacked the *Victoria regia*, and, consequently, it is not so handsome as it once was. Rand's variety is grown, and is distinguished from the type in having a deeper rim to the leaves. The Sacred Bean (*Nelumbium speciosum*) is quite at home in a pool along the edge of a swamp, and, judging from the growth it is making, would soon cover a large territory.

Wellesley, Mass.

T. D. H.

Scab-proof Apples.

To the Editor of GARDEN AND FOREST:

Sir,—The relation of the Apple-scab fungus to the different varieties of Apples is an important one, and is worthy of careful investigation. Dr. Hoskins, in GARDEN AND FOREST for August 3d, p. 370, thinks one of my statements in the issue of June 29th, p. 310, is too emphatic. I said then there are no varieties of market apples in western New York which are not subject to the attacks of the scab fungus. The statement is a strong one, but I intended that it should be. Since Dr. Hoskins has commented upon it I have reconsidered it carefully. I have also visited many orchards in western New York, and a few days since I had the good fortune to be visited by one of the mycologists of the Department of Agriculture. We examined Baldwin trees in a commercial orchard, the Baldwin being, perhaps, as nearly scab-proof as any of our market varieties. The foliage was comparatively small and gray, and stiff from the attacks of the fungus, and many of the fruits themselves were scabby. I am convinced that my former statement is true—that we have no market apples in this region which are not subject to the scab to a detrimental extent. In some years nearly all varieties escape, and some varieties are more free from scab than others; but there are years in which all suffer, although not, perhaps, to an equal extent.

I cannot admit that the liability to attack of scab is an indication of a "constitutional defect" in such variety. I have not yet seen any facts which would lead me to think that the fungus attacks the less vigorous or less hardy varieties, using the term hardy in its ordinary sense in the north, as an ability to withstand untoward circumstances of climate and surroundings. I have not found that there is any decadence in the constitutional vigor of varieties, as a whole, in recent times.

One other important consideration must not be overlooked here, and that is the fact that enemies often progress or develop as rapidly as do the host plants. I imagine that by the time we are able to breed scab-proof varieties—from the present standpoint—our scab-fungus will have developed a capability to attack more uncongenial hosts. This is the common history of injurious insects and fungi; they take on new habits to accommodate themselves to new conditions. It is possible that a good market apple may spring up which is for the time scab-proof; but when we have learned how to produce such kinds with tolerable certainty, the enemy will have grown cunning too, I fear. How many are the Pears which are sent out as blight-proof, and yet in a few years they suffer with the rest. We are in the habit of distrusting the originator who makes this claim if it turns out false in after years, but I am inclined to think that some of these varieties really are measurably blight-proof at first. If the histories of varieties of fruits could be written from the natural-history side, I fancy that many of our notions would be upset.

I would not discourage Dr. Hoskins' efforts toward scab-proof apples, but I am not over-confident of success. For my generation, at least, I must pin my faith to the squirt-gun.

Cornell University.

L. H. Bailey.

The Ten Mile Woods of Hartford.

To the Editor of GARDEN AND FOREST:

Sir,—At the north end of Hartford, within the limits of the city, begins a stretch of woodland interesting alike to the student in natural science and history. The Tunxis, Podunks and Poquanak Indians roamed in these now utterly neglected woods, which reach out toward the ancient town of Windsor. A large variety of native New England trees and shrubs grow here in natural profusion and beauty; wild Grape-vines encircle the trunks of forest-giants, and berries of all kinds make luxuriant growth. Cardinal-flowers are just past their best bloom.

There are Asters of many colors, and the white and blue Gentian and the later fringed Gentian are abundant. Wild Lilies thrive in the rich earth, and our American *Nelumbium* decorates the still waters of the lakelets. In the spring the ground is covered with *Hepatica*, *Trailing Arbutus*, *Trillium*, *Jack-in-the-Pulpit* and *Dog-tooth Violets*. Ferns grow luxuriantly, the common *Bracken* pushing up to a height of six feet. There are, besides the rare and beautiful climbing Fern, various *Polypodiums*, *Osmundas* and *Maiden-hairs*. On the sand-dunes the pink and blue *Lupines* flourish, and the clear and cold trout streams are bordered with Sweet Fern. The stately heron is at home in this tangled wild wood as well as all the song birds of the region.

Old residents remember these woods when they extended nearly a mile farther south than their present limit, and within my recollection they have been encroached upon from all sides by clearings for agricultural purposes and by newly built homes. There is left, notwithstanding the willfully arranged annual spring and fall fires, a large tract of this desirable and valuable forest. The Charter Oak City should acquire and own that portion, now private property and subject to such destructive treatment as the whims and necessity of the present owners may direct. Some months ago, on the recommendation of a number of citizens, the City Council took favorable action in the matter of securing a tract of land near Trinity College for park purposes. At that time the local press urged that large outlying tracts be purchased by the city and connected by improved road-ways, so as to make a continuous drive leading up to the Ten Mile Woods, and Mr. Frederick Law Olmsted clearly stated the desirability and value of such ownership and improvement.

Nothing has been done, however, toward preserving this natural inheritance, which, properly treated, would be not only a beautiful park and woodland, but would have a distinct value for botanical study. In my opinion, too, if this forest were managed on the most approved principles of forestry, its products would make the purchase a profitable investment for the city. To the generous and patriotic tribute to our national defenders in the soldiers' monument, the city should add the purchase of the Ten Mile Woods, as an enduring, living monument to peace and education.

Hartford, Conn.

Wilhelmina Seliger.

Shrubs for a Screen.

To the Editor of GARDEN AND FOREST:

Sir,—The entrance to my place is a bank about seven feet in height above the road, with a very sharp slope toward the entrance-drive and a gradual descent on its other side. It is about one hundred feet in length. I would like to plant it out so as to give as much as possible the effect of retirement and privacy. On the opposite side of the drive is the gate-lodge, low and simple, and the surroundings are of the rather poor Oak-forest, indigenous to the south side of Long Island. The character of the country is such that this entrance should be unobtrusive and not accentuated by masonry.

I should like your advice as to the best shrubs to use in planting. *Rhododendrons* are not suitable, as they only do well here when shielded somewhat from the north winds and the sun, and they also require a location where the moisture does not immediately run off, as would be the case on the bank in question. You will, I think, agree with me that, in such a position as I have indicated, an evergreen character is desirable—or, at any rate, that shrubs should be selected which retain their foliage late in the season. I do not fancy conifers for covering the bank, although a few might be judiciously introduced. It may be added, that the situation is favorable for a carpet of *Periwinkle* where desired.

Oakdale, L. I.

C. B. W.

[It is not easy to give a planting list for a place which one has never seen, but it seems that the desire of our correspondent for unobtrusive plants could not be better obtained than by using largely some of our native deciduous shrubs. *Viburnums* and *Cornels* are good to begin with, and among these we would suggest *Viburnum dentatum* and *V. casinoides* as having the best foliage, while *V. Lentago* could be used where taller growth is wanted. Among the *Cornels* could be used *Cornus sericea* and *C. paniculata*, with *C. stolonifera*, and more especially *C. alba*, to brighten the shrubbery with their stems in winter. Several of the *Barberries* might well be introduced, and an occasional plant or two of *Leatherwood* would help to make the

shrubby interesting by its early flowers in spring. Sumachs make a good covering for banks, but the Staghorn Sumach is of too rank a growth to be planted with the shrubs already mentioned. We have seen excellent effects produced by using together three native species with *R. typhina* for the background, followed by *R. copallina* and *R. glabra*. *R. aromatica* is well suited for planting on banks. It is not easy to get satisfactory shrubs for this region which keep their leaves late in autumn, but the Privets are suitable for such a situation, while the showy-fruited and almost evergreen *Cratægus pyracantha* would probably do well. Too great a variety is not advisable where a quiet unobtrusive effect is desired, but Wild Roses might be introduced among a planting of Cornels, *Viburnums* and the like.

Rosa Wichuriana, which has been frequently mentioned in our columns, would probably prove a good plant for covering the ground instead of the Periwinkle. It might be used alone in covering a bank, or it will grow if planted among tall shrubs, in which case many of the stems will clamber up along the branches. It would very quickly cover a bank in the climate of Long Island and would prove practically evergreen.—Ed.]

The Skimmia.

To the Editor of GARDEN AND FOREST:

Sir,—*The Garden* (London) of August 13th has an illustration of *Skimmia fragrans*, which shows a very attractive plant, but the text does not give all the information concerning it that is desired. I turn to Nicholson, and find under the proper head: "A genus comprising half a dozen species of pretty, hardy evergreen, highly glabrous shrubs, with green branchlets, natives of the Himalayas and Japan. Flowers whitish, clustered; calyx short, four or five lobed; petals four or five, oblong, much longer than the calyx, valvate or loosely imbricated, etc." The fruit of the species *S. Japonica* is described as bright red in March. This account, taken in connection with the article in *The Garden*, indicates an interesting group of which but little is known.

Newport, R. I.

L. D. Davis.

[Trials of the *Skimmias* at the Arnold Arboretum have not proved them satisfactory plants there. Several forms have been tested, but as yet they have shown themselves rather too tender for the climate, in spite of winter protection. If they survive the winter, the blossoms are hurt by spring frosts, and the showy fruit does not follow. We observe that several nurserymen of the southern and middle states advertise these plants, and we should be obliged if any of our readers who have tried them will give the results of their experience.—Ed.]

Recent Publications.

Nature Study, for the Common Schools. By Wilbur S. Jackman. Henry Holt & Company.

The publication of this book and many others on kindred topics is an evidence that the study of natural science is making steady progress in our public schools and that kindergarten methods are growing in favor among the better class of educators. Professor Jackman, however, has not made a textbook in the ordinary sense of the word; his work gives little or no information on the subjects treated, advances no scientific theories, makes no attempt to deduce scientific laws; but aims simply to show how one teacher awakened a love of nature study in the pupils entrusted to his care by an intelligent use of materials taken almost at random from Nature's own workshop. In fact, the writer seems little troubled by theories of any kind. He has no preconceived ideas as to the proper order of development of the childish faculties, nor does he advocate any formal or logical sequence of studies to which everything must bend; he merely notes the eager curiosity with which the child examines every object in the world about him; that impartial interest which turns with equal zest from the pebble at his feet to the rainbow in the sky, and supplying it with abundant materials for observation, he makes its instinctive delight in the natural world a stepping-stone to the development of the higher faculties.

The introductory chapters treat of the motive for "Nature Study," and the various modes of developing the child's powers of expression, which should always go hand-in-hand with the acquisition of knowledge, but the body of the book consists of a series of graded lessons in botany, zoölogy, physics, chemistry, meteorology, astronomy, geography, geology and mineralogy, the subject-matter of which is adapted as far as possible to the changing seasons of the year. As the school world begins in September, it is the vegetable and animal life of September, the September storms and the September sky which the child is first called upon to notice, and thus he learns to note in turn the peculiar influence of each season upon all the world within his range of observation. These lessons consist chiefly of sets of questions stimulating and suggestive enough to awaken interest even in children of a larger growth, and, in the hands of an enthusiastic teacher, they must make the hours spent in such study one long delight. It is enough to fill one of the older generation with surprise, although not with amusement, as he reflects that, according to modern theories, that part of his knowledge which he can least afford to lose was acquired not while sitting on hard benches in poring over lexicons and text-books, but in the long stolen rambles over the hills, through sunny meadows or by tempting brooks, every hour of which had the exquisite flavor of forbidden fruit, and gained in charm from the thought of the reprimand, and perhaps the punishment, in store when the truant returned to the neglected duties of the school-room. Whether the rambles and the birds-nesting, the expeditions in search of fruit or nuts will not lose something of their charm now that they are incorporated into the school curriculum, is a question we leave to philosophers, but to the layman there can be no doubt that a scheme of instruction which recognizes and provides for the development of all the faculties must in time produce a race of men and women more fully equipped for the struggle of life, in which, according to Darwin, the race is always to the swift and the battle to the strong, than the time-honored system of our forefathers, which regarded the alphabet as the key to all knowledge worthy of the name.

For the method of study set forth in this volume we have only praise, but it may be questioned whether the motive to which Mr. Jackman seems to appeal in his effort to awaken a love of nature is the highest that can be offered. It seems like putting a premium upon one kind of selfishness to say that the individual's own life is the centre of all his interest in the world, and that how to prolong it should be the ultimate aim of his study. This is only partly true. The instinct of self-preservation is so strong that every individual early learns to adapt himself to his own environment, while the special knowledge which has enabled man to control and direct the forces of nature, and so enlarge the sphere of human activity, has been gained by scientists who, through their long years of toil, thought their own lives of little value in comparison with the service they could render to their fellow-men. In the study of science, as in all else, he who would seek to save his own life must lose the higher joy, and a knowledge of Nature's laws gained solely for this purpose will prove rather a snare to its possessor, revealing, as it will, the thousand roads that lead to the shadow from which he is trying to escape.

Most of those who study science in our public schools are doomed to lives of monotonous toil, beginning often before the years of childhood are past. In these lives of toil self-interest must be the prevailing motive. The knowledge the pupils can gain in school must necessarily be limited, and can go but a little way toward softening their hard conditions. The true teacher, then, during the years in which the child is under his care will strive to implant that impersonal love of nature which lifts its possessor for the time above all sordid and material interests, and gives him that refreshment of the spirit which comes only when thought of self has been laid aside.

Notes.

We have observed several *Kolreuteria* trees near this city which appear to be suffering from some blight. In one or two cases nearly all the leaves have fallen to the ground.

The *Southern Lumberman* takes a strong stand in favor of the Paddock Bill for the establishment, protection and administration of public forest-reservations. It also states that the suggestion in this paper of establishing a forest-reserve in the southern Alleghanies is warmly seconded by the timbermen of the south-eastern states.

A writer in the *Pomona Progress*, basing his estimates on the profits of his own Prune-orchard and the figures given him by four of the most careful growers in Pomona Valley, California, makes the rosy statement that ten acres planted with French Prunes will, within ten years, yield an easy annual net income of \$5,000. The outlay for such an orchard during the first four years will be something less than \$3,000, including interest. This outlay will be nearly equaled by the crop of the fifth year, while a handsome profit is assured the next season.

According to a California dispatch in *The Tribune*, a small grove of Big Trees has been discovered in Placer County, on the middle fork of the American River, not far from Forest Hill. It was found by William W. Price, a botanical student in Stanford University. He thinks that this grove, of which only six trees are standing, marks the extreme northern limit of the growth of *Sequoia gigantea*. Some of the fallen trees measure twenty feet in diameter. The grove has probably been saved from complete extinction by a dense growth of Sugar Pines which surrounds it.

The identification of nearly all Grasses at any time is a difficult task for nearly every one, even for most botanists. The Grasses vary much, and in many instances they closely resemble each other. These difficulties suggested to Dr. Beal a paper, which he read before the Society for the Promotion of Agricultural Science, in Rochester, last month, entitled "How to know our common Grasses of Pasture and Lawn before they Flower." The paper was practically a key in which the distinguishing characters were laid down of seventeen of the more common Grasses, which are about all that the farmer is likely to meet in his lawn or pasture for the first month or six weeks of the growing season.

In a letter to *The World*, of this city, Mrs. Van Rensselaer states that the lawns and grass-plats about the private houses in Chicago are exquisitely neat and green, and in the great majority of cases they have not been decorated after the fashion which prevails in some eastern cities. Occasionally one sees a fine lawn defaced by gaudy pattern-beds or by groups of tall foliage-plants or by ornamental shrubs heterogeneously scattered about. But, as a rule, there is nothing but the quiet grass, or a line of trees and shrubs at the back hiding the kitchen regions and the week's wash, or else there are one or two great trees agreeably shading, without disturbing, the pretty expanse of verdure. Owners of New York areas might well go to Chicago to learn what to do to their tiny plots of grass, and owners of Newport cottages would there be just as usefully instructed in the great art of what not to do to their larger lawns.

Professor Georgeson, of the Kansas Agricultural College, writes to the *Industrialist* that he is filling a small silo with a portion of the Soy Bean crop in order to test its feeding value when so preserved. He has four varieties, two of which are so far advanced toward maturity that the leaves have begun to fall, while in the others the seeds are only half-grown. The plants were grown in rows thirty-two inches apart in loam of only fair quality, which has not been manured, and the yield of green plants is about five and one-third tons to the acre. The growth has been made in exactly three months. Its feeding value compares favorably with that of Clover and Alfalfa in nutritive qualities, and the ripe beans are only excelled by oil-meal. Cattle and hogs eat all parts of the plant greedily, and even the dry bean-straw, thrown into the yard after the beans were threshed out, was all eaten by the cattle. But, perhaps, the quality which will be most highly appreciated in Kansas is its power to withstand drought, so that not even the severe drought of last year affected it disastrously. When all these qualities become known, Professor Georgeson thinks it must take a leading place among our fodder-plants.

The strain or variety of *Solanum jasminoides*, which has been distributed under the name *Grandiflorum*, is certainly a most attractive climber for summer blooming. A plant of this, procured in the spring of last year and set in the open ground, spread over a trellis about eight feet high, and was covered with flowers when cold weather set in. In October it was cut hard back, lifted, placed in a twelve-inch pot, and kept all winter in a cool room, where it received little direct sunlight, and was sparingly watered. This spring the pot was sunk in the ground, and the vine started away with vigor. By midsummer it began to flower, and now it is more than twenty feet long, covered with large clusters of pure white flowers at the extremity of branchlets furnished with foliage of the glossiest green. It is quite as attractive in its way as *Clematis paniculata* now is, and this is paying it a high compliment. It

makes an admirable window-plant in an ordinary living-room. In Florida we have seen *Solanum jasminoides* covering a large porch and blooming luxuriantly in February. It was there called "Gloria," and it seems unfortunate that it has not an appropriate and popularly accepted name besides its clumsy scientific one.

It is feared by the importers of seeds and bulbs that the precautions against cholera may kill or keep out of the country a good many plants besides the comma bacillus. The long delays at Quarantine in the close holds of steamships will injure many seeds and bulbs and kill many living plants outright. Besides this, a delay at this season of active opening of the fall trade is most annoying, and it will cause much disturbance, if not pecuniary loss. Many invoices have not yet left the other side, and importers hardly know whether to countermand their orders or allow the stock to take the chances of quarantine delay, and what is still more dangerous, of quarantine disinfection. It may be that some of the vapors used to destroy cholera germs will not kill Holland bulbs, for example. But some of the processes in which hot steam is used to kill the comma bacillus by sheer heat would be likely to cook bulbs beyond all hope of germination. We hope the dangers of the situation are not so serious as some have feared. Importers will doubtless order shipment only from clean ports, and if health officers use proper judgment in selecting their modes of disinfection, seeds and bulbs ought to escape without injury. But it is well worth while for the importers of stock of this character to make a united effort to secure fair treatment.

There is nothing in our climate, soil or other conditions to make the hybridizing of Roses more difficult in this country than in Europe, and yet, as is well known, a great proportion of the new Roses which have proved valuable to the commercial grower and popular with amateurs have been imported. One reason for this is that there are comparatively few persons in this country who give their leisure to the cultivation and study of the queen of flowers—or of any other flower, for that matter. Why commercial growers in this country, when the sale of cut Roses is so enormous, have not given more attention to the production of new varieties is more difficult to answer. Mr. John N. May says they are too busy, but he says further that they do not hesitate to buy and try all the new varieties from Europe and pay high prices for them, although hardly one in a hundred is worth anything in this country for any purpose. Mr. May gives it as his view in *The American Florist* that if the new American Rose Society were established with sufficient capital and income to offer liberal prizes for different classes of hybrids we should soon have plenty of new Roses which would not only be good, but the best for special purposes in this country. We have already produced some good seedlings for cut flowers. Mr. Carman has been experimenting and is hopeful of getting a Rose of genuine value. Mr. Dawson has already scored some striking successes, and we have no doubt that the seeds of many good novelties are ripening now. What we should like in addition to such well-known classes as the Hybrid Teas would be a still wider range of varieties, an extension of the work already begun by experimenting with such distinct species as *Rosa rugosa*, *R. multiflora* and the Sweet-brier. *R. Wichuriana*, with its very distinct habit, is a promising subject, and, perhaps, *R. foliolosa*. Certainly our Prairie Rose, *R. setigera*, is worth crossing to gain fragrance and other good qualities, and why not some of our other hardy wild Roses? Farther south what might we not hope to obtain in the way of open-air Roses by using *R. bracteata* and the Cherokee Rose?

Catalogues Received.

WILLIAM BULL, 536 Kings Road, Chelsea, London, S. W., England; Tuberos-rooted Plants and Bulbs.—J. WILKINSON ELLIOTT, Pittsburgh, Pa.; Import Price List of Rhododendrons and Japanese Plants.—MADISON SQUARE GARDEN SPRING FLOWER SHOW, APRIL, 1893; Schedule of Prizes offered for Orchids, Roses and other Flowers and Plants.—PAPE & BERGMANN, Quedlinburg, Germany; Bulbs and Seeds for Fall Planting.—PITCHER & MANDA, United States Nurseries, Short Hills, N. J.; Bulbs, Seeds and Plants for Fall Planting; Fresh Imported Orchids.—GEORGE RUEDY, Colfax Nursery, Colfax, Wash.; The Palouse Apple.—RUSSELL BROTHERS, Highlands, N. C.; Native Ornamental Trees, Shrubs and Plants of the Southern Alleghany Mountains.—STARK BROTHERS, Pike County Nurseries, Louisiana, Mo.; Fruit Trees, Small Fruits, Grape Vines, Ornamental Trees, Shrubs and Roses.—VILMORIN-ANDRIEU ET CIE., 4 Quai de la Mégisserie, Paris; Flower, Bulbs and Seeds for Fall Planting.—THOMAS S. WARE, Hale Farm Nurseries, Tottenham, London; Flower and Vegetable Seeds.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLES:—Elbow-room in the Country.....	445
Gaudy Floral Devices.....	445
The Woodcock Oak. (With figure.).....	446
Pine Bark..... Mrs. Schuyler Van Rensselaer.	446
Native Shrubs of California.—VIII..... Professor Edward L. Greene.	447
The Polemoniaceæ of the Lake Region..... E. J. Hill.	448
FOREIGN CORRESPONDENCE:—London Letter..... W. Goldring.	449
CULTURAL DEPARTMENT:—The Self-pollination of the Grape. (With figures.)	
Notes on Begonias..... Professor S. A. Beach.	451
Cape Oxalis.—II..... J. N. G.	452
Kæmpfer's Iris..... W. E. Endicott.	452
Eschscholtzia Californica..... E. O. Orpet.	452
ESCHSCHOLTZIA CALIFORNICA..... W. M. Munson.	453
CORRESPONDENCE:—Autumn Flowers at Passaic, New Jersey..... J. N. Gerard.	453
Russian Fruits..... C. L. Watrous.	453
Albino Orchids..... Mrs. Thomas Baxter Gresham.	454
California Roses..... H. G. Pratt.	454
Cypripedium Edwardii..... Robert M. Grey.	454
RECENT PUBLICATIONS.....	454
NOTES.....	455
ILLUSTRATIONS:—White Oak, near Bedford, Westchester County, New York,	
Fig. 74.....	450
The Opening Bud of a Grape-flower, Fig. 75.....	451
Pistil and Stamens of a Grape-flower, Fig. 76.....	451
Two clusters of the Lindley Grape from the same vine, with abortive	
fruits showing lack of proper pollination, Fig. 77.....	451

Elbow-room in the Country.

IT is a curious fact that the dwellers in rural towns who might easily supply themselves with plenty of land if they were willing to desert the main street, choose by preference a small lot with closely contiguous neighbors rather than strike out for themselves in a new direction. We can understand that, in the early settlement of a community, the inhabitants would naturally cluster together for companionship and protection, but when a village is fairly established it seems a pity that people should not realize how much better it is to have room to exercise their taste in cultivation, and also a place where the seclusion and privacy of a country life can be truly enjoyed. Life on the village street is less retired than in the busiest thoroughfare of a great city, for as there is not much to occupy the mind of the dwellers in small towns, the goings out and comings in of the neighbor are a matter of interest and gossip, and one can be pretty sure of a free discussion and intimate understanding of his domestic affairs by the lady over the way or behind the rear fence. Why people should submit to this, when, for the same amount of money, they might furnish themselves with ample elbow-room, is one of the puzzles which our race supplies freely for the philosopher.

When a man from the city chooses a spot a little remote from the others, he is thought to be living "in the woods" or "out in the lot," and much wonder is expressed that he should find anything in such a distant locality to make it worth his while to build there. A walk of half a mile is apt to preclude anything like "dropping in" in a village neighborhood, and really seems to shut the owner of a considerable farm out of the social current which flows up and down the main street of a village, but rarely branches off. People of limited means do not seem to value the resources and delights of country living as they deserve, nor do they readily learn to find pleasure in outdoor pursuits

nor recognize the quiet satisfactions which the thoughtful and practical can alike find in the effort to adorn and make fertile an acre or two of ground. Yet, converse with woods and fields, with shrubs and flowers, is more valuable to the spirit than village-gossip, nor need it preclude human sympathy of the broadest kind. Possibly our British brothers are right when they set the land-owner above the Philistine, and measure a man's social consequence not by his money but by his acres.

As in most social distinctions, there is some sort of instinctive basis for ranking a cultivator of his own acres above a shop-keeper, it implies a different order of faculties, a certain dignity of possession, "a stake in the country," as the English put it, so that the first impulse of a man, after he has made his shop-keeping a success, is to own a bit of his tight little island, and thereby establish a claim to some local distinction. Land is so cheap and plenty as yet in this country that we have not begun to value it as it deserves. A man appreciates the number of square feet of his possessions in a city, and by no means lacks appreciation of his ground-rents; but there ought to be a feeling for the soil of one's native land in the country quite apart from its mercantile value, so that one should start in life with an ambition to possess finally a bit of it, which would save more of our surface for the native American.

For in the Irishman is born the true passion to own a farm, which is the secret of their prosperity in the rural districts. It is astonishing to see how, with so many mouths to feed, and such limited means of feeding them, the Celt will acquire his Potato-patch, and hold on to it and add to it under the nose of his indifferent Yankee neighbor, refusing to part with it, though sorely pressed, and holding it always at a price he would never be willing to pay for it. This habit which we recognize, and laugh at good-humoredly, it would be well for Americans to acquire in time to keep some of the country for themselves. It is not enough to own a house-lot; it is a good thing to have land to cultivate for ornament if not for profit, if people have money to spend, and are at a loss for steady amusement and occupation. To such the cultivation of a garden promises a new delight—an unfailing interest; and by a garden we mean not merely shrubs and flowers, but the garden in a larger sense, as the expression of taste and artistic feeling and skillful planning, so that even the useful may contribute to the beauty of a place, and everything form an essential part of a harmonious and pleasing picture.

And we urge the acquirement of land by our people because it is a taste that grows upon one. No sooner does a man acquire one acre than he wants two; give him five, and he desires ten; a hundred, and he clamors for more, so it is well in purchasing a country-place to get enough in the beginning to make your work worth while, and to keep your lines sufficiently remote from your dwelling to avoid the discomfort of near neighbors, who sooner or later will become an oppression. For the desire for elbow-room grows upon one as he cultivates; he ever desires to add to his possessions, to extend his boundaries, to subjugate more and more of the earth to his use or pleasure, and this is a good and wholesome desire, which he does well to gratify, for, according to old Cowley, it is the garden which was God's first gift to man:

For well He knew what place would best agree
With innocence and with felicity;
And we elsewhere still seek for them in vain;
If any part of either yet remain,
If any part of either we expect,
This may our judgment in the search direct,
God the first garden made, and the first city Cain.

A CERTAIN French paper, says an editorial paragraph in a recent number of the *American Architect and Building News*, "describes a novelty which we commend to the attention of landscape-gardeners and park commissioners. There is now on exhibition in Paris, near the Trocadéro, a horticultural clock. This object consists of a bed of Alternantheras, Lobelias, Echeverias and the other proper-

ties of carpet-gardening, forming a huge disk, thirty-three feet in diameter, with the usual figures and dots of a clock-dial around the edge. On the dial move two long poles, decorated with flowers, and forming the hands of this novel clock, which keeps time with sufficient regularity. The hands are attached by a simple mechanism, sunk below the centre of the bed, and driven by a small water-motor. Where circumstances favored, we should say that an improvement on the carpet-bed dial might be made by surrounding a circular tank of aquatic plants with a sloping bank, on which the figures of the clock-dial could be made with the usual dwarf variegated plants, the whole being surrounded by a railing. It would be easy to set a box, containing the mechanism for driving the hands, in the middle of the tank, and the waste water from the motor could be utilized as the regular tank supply." These words are a surprise in a journal which usually upholds good taste in horticultural as in other matters. The guardians of our parks and the gardeners who make them need to be told that horticultural arrangements should be artistic, and not of a kind calculated to encourage a crude taste by creating showy horticultural toys which appeal to childish curiosity. These arrangements must be either of a natural sort or of a formal and palpably artificial sort, according to existing conditions. But, whatever the type, the same canons of taste which govern the proper ornamentation of a building ought to control the ornamentation of a garden or park. This fact is the one which most needs teaching—the fact that gardening is an art in as true a sense as painting, sculpture or architecture. To imitate a dial-plate with flowers and set wooden or metallic hands to moving around it by clock-work is not to design as an artist would. The arrangement which the *American Architect* commends is of the same class as the striking "floral devices" which often encumber our parks, cemeteries and the lawns of country-places. If Paris has its floral clock, Chicago has its floral sun-dial, the shadow upon which is cast by a tall inclined post composed of House-leeks. The fact that this style is common in Europe may explain its existence here but cannot excuse it.

The Woodcock Oak.

THE White Oak is one of the most familiar trees in the forests of north-eastern America, and yet we rarely see a tree of this species which has reached its full lateral expansion. The primeval Oaks of our forests grew like other forest-trees, with long, straight stems, and when the forests were cleared away, if individual trees were left standing, they showed nothing of the character which they would have had if they had grown in the open ground. At least a century is required for one of these Oaks to reach maturity, and much more than a century is needed before it attains those dimensions which mark it among our other trees as the very type of sturdiness and strength. Since the first clearings were made only an individual here and there has been allowed an opportunity to throw out its huge branches with the bold horizontal sweep which characterizes the tree in our illustration on page 450.

We have already published pictures of several famous White Oak-trees, including the Waverly Oaks, but only when we have portraits of several individuals can the full expression of the tree be apprehended. We are, therefore, glad to give an illustration of this "Woodcock Oak," as it is called, which stands about four miles east of Bedford Station, and one mile west of Bedford village, in Westchester County, New York. It is near the angle made by the Hook road and the highway between the two points mentioned above. Five feet above the ground it measures fourteen feet two inches in circumference, and two feet above the ground its girth is nearly seventeen feet. Its branches cover a circle of a hundred feet in diameter, and it is in all its proportions worthy to be classed among the notable trees of a region where fine trees are not rare.

Pine Bank.

ONE of the most beautiful spots which have been acquired by the energetic Park Commission of Boston for the refreshment of their fellow-citizens is the old estate called Pine Bank, on the border of Jamaica Pond. As the readers of GARDEN AND FOREST have already been told, the urban pleasure-ground called the Back Bay Fens, recently laid out by Mr. Olmsted, is to be connected with the Arnold Arboretum by the Riverdale Parkway, which will skirt Jamaica Pond; and several estates fronting on the pond, which is really a good-sized lake, have already been secured for this purpose. None of them is as beautiful or as peculiar in its beauty as Pine Bank, long the homestead of the Perkins family. This consists of some fourteen acres of thickly wooded ground, considerably elevated above the water-level and approached by Perkins Street. The original house was built in 1802. In 1847 it was torn down and a new one erected; this was destroyed by fire in 1869, and the present dwelling was constructed on the same site, I believe by a French architect. It is a two-story building of stone and terra-cotta, with three gables and a square projecting porch on the principal or lawn front. The carriage-drivesweeps up to the doorway on the opposite front, passing through thick growths of fine trees—Pines, Elms, Maples, Birches, Poplars and Buttonwoods. Here nature has not been conspicuously interfered with, only just enough to make the drive seem not a wild woodland road, but a fitting approach to a dignified home. Near the house are two deep, roundish, natural depressions in the ground, lovely grassy basins, which give this part of the place an individual accent, looking like little green ponds overhung with shadowy trees. On either side of the house the trees approach it nearly, and the stables are so shielded by them as not to be a disturbing element in the scene, as they too often are in small American country-places.

The other side of the grounds, fronting on the water, are still more attractive. Here the verdant surroundings are not disturbed by drive-ways or walks. The porch opens directly upon the lawn, and the smooth emerald grass extends for a considerable distance to the border of the steep high banks which overhang the pond. There are no flower-beds and no disturbing horticultural embellishments of any kind. But on either side the lawn is enframed by the thick naturally growing masses of trees, and in front the water and the opposite shore of the pond are seen through a screen of big Pine-trunks and feathery foliage, so that no more truthfully expressive name than Pine Bank could have been chosen for this delightful home. When I visited it some years ago it was uninhabited, and its effect was as of the home of some Sleeping Princess, where summer must perpetually reign, for the thick plantations absolutely shut out the noisy world behind it, and so screened the water-view that one found it hard indeed to remember that a big and busy city lay only a few miles away, and that other homes of busy modern people might be reached by a few moments' walk. Nothing more exquisitely retired and self-contained, nothing more poetically beautiful, complete and slumberous, could be imagined than Pine Bank as it then appeared; and when one recollected that the days of fairy-tales were over, and sought for an actual modern purpose to which Pine Bank might appropriately be put, it seemed as though it ought to be bought by some sentimental philanthropist and its name changed to "Honeymoon Hall," to signify that it would perpetually be preserved as a place of retirement for successive young couples unable to fly for a brief period further afield.

Now it is to be given to the people of Boston for their perpetual use, the handsome house will be preserved, and, I hope, the grounds will not be altered. Very few such charming and individual spots can exist in the neighborhood of our large towns; and this one will be invaluable as an object-lesson in the great art of treating—or of letting alone—home-grounds of an essentially woodland character. The flight of worn stone steps which leads down from the edge of the lawn to the water-side, originally belonged to the old Hancock House on Beacon Street, in Boston, and was secured by Mr. Perkins when this house was destroyed. "They are valuable as relics," writes Mr. Perkins now to the Park Commissioners, "because the most distinguished persons of colonial and revolutionary times have ascended and descended them in going to and from the hospitable door of the old mansion-house." I think they could not be put to a better use to-day than to serve the tired artisans and lively boys of Boston as an approach to the pleasure-boats which, one fancies, will be provided for their use beneath the edge of the beautiful lawn of Pine Bank.

For one, I am thankful to the Park Commissioners of Bos-

ton for bringing this beautiful place to general attention, and for the opportunity to praise its beauty, and to say that the one visit to Pine Bank remains among the fairest of those pictures which every traveler preserves in a special little inner mental gallery, apart from thousands of others which, despite greater magnificence or more striking associations, are nevertheless not his best and dearest. If I tried to count over a dozen scenes which had most poetically spoken to my imagination as well as delighted my eyes, one among them would surely be the picture of Pine Bank on a hot summer afternoon when the sunlight slanted through the Pines, touching to green-gold the grass which looked as though no foot heavier than a fairy princess's had trodden it for years, and turning the pretty sheet of water beyond the screen of whispering Pines into a stainless azure mirror. Good days have, indeed, dawned for the people of our large towns when such spots as this are secured for their perpetual pleasuring.

New York.

M. G. Van Rensselaer.

Native Shrubs of California.—VIII.

OF the *Ceanothus* genus, or California Lilacs, as they are not inaptly called, there is so great a variety on all our hills and mountains that one scarcely knows with which to begin the account. They are a large part of that almost impenetrably dense brushwood, called "chaparral," which covers middle elevations of the Coast-range, forming a distinct belt between the herbaceous vegetation of the foot-hills and the forest-growth on the highest ridges and summits. Another series of species, distinct from those of the Coast-range, inhabit the Sierra Nevada, and are more commonly interspersed among the forests, or along the borders, mingling with other woody growths.

Among the Coast-range species, *C. thyrsiflorus* holds a conspicuous place in point of ornamental qualities. Though often flowering profusely as a shrub six or eight feet high, under favorable conditions it matures into a shapely tree twenty-five feet or more in height. In habit it is compact as the Lilac, with green-barked branches and twigs, and a deep, glossy three-ribbed foliage. It is strictly evergreen and flowers more or less freely from March to May, the color of the large, dense clusters being a perfect blue. In any collection of ornamental shrubs it should hold a welcome place. Twenty years ago it was no rarity upon the lawns and shrubberies in the northern parts of San Francisco, where it had been spared when other and less attractive native growths had been cleared away for the establishment of homes. This species is not found away from the seaboard, nor has it an extensive range along the coast. It is, I believe, hardy in England, where it has been much admired, though in that climate it is not well at home, if we may judge from Lindley's figure in the *Botanical Register* (vol. xxx., t. 38), in which it appears with a comparatively pale foliage and lax clusters of light blue flowers, altogether of inferior beauty compared with the shrub on its native hills.

On the flanks of Mount Tamalpais, and in many like situations among the Coast-range hills, grows *C. sorediatus*, very unlike *C. thyrsiflorus* in habit, and displaying a greater profusion of bloom in very small clusters. Although its branches and branchlets are short, stiff, and even somewhat spinose, they have a curving tendency which gives to the bush, in a mass, a rounded, rather than angular outline, and the whole surface of a well-grown specimen in full flower appears like a billowy mass of sky-blue, the flower-clusters, though small and short-stalked, decking every twig. Many years ago some small plants were transferred from the adjacent hills to the university grounds at Berkeley, where they have ever since been subjected to an annual clipping by the workmen on the grounds, and reduced to solid hemispherical or conical outlines. These plants have suffered little by this unkindly treatment, and each spring, for weeks together, they are like leafless cones of blue, the flowers quite concealing the foliage. This hardy native is one of the best shrubs for edging purposes, whether desired for usefulness or ornamentation. Like *C. thyrsiflorus*, it is evergreen, the foliage small and of rounded outline.

Every one who has journeyed to any part of the Sierra Nevada in early summer has admired *C. integerrimus*. This is a large shrub of loose and open growth, with thin sea-green foliage and very conspicuous long-stalked clusters of flowers, prevailing white, though occasionally pale blue. It has not the merit of perennial verdure, the foliage being mainly deciduous, and for this reason, although it is perhaps the most beautiful of all *Ceanothus* when in full bloom, it is not particularly attractive at other seasons. The Coast-range counterpart of this species is the somewhat rare *C. Andersonii*, with more abundant foliage than *C. integerrimus*. The leaves are smaller

and the panicles of white flowers at least equally conspicuous and more profuse. It has been found only in the neighborhood of Santa Cruz, but the botany of the mountains southward is yet scarcely explored, and *C. Andersonii* is in all probability established there. In the Santa Barbara region of the Coast-range is *C. spinosus*, another exceedingly handsome species of the larger and arborescent class. This has glossy evergreen leaves of small size, and ample clusters of light or deep blue flowers. It takes its specific name from the fact that many of the branches end in sharp, leafless, spur-like, or, rather, thorn-like points. Across the channel from Santa Barbara, on the large island of Santa Cruz and one or two neighboring islets, is found a peculiar *Ceanothus*, extremely unlike any mainland species, and the largest member of the genus. It was discovered by the writer in 1886, and named *C. arboreus*, in reference to its great size, clean tree-like trunk and well-rounded head. Its broad and ample foliage is white underneath, and the flower-clusters white or pale blue. In Professor Sargent's *Silva of North America* this is figured as a variety of *C. velutinus*, to which it seems to me to be as little related as to any species of the genus. It has one close ally, however, in a Mexican species, *C. azureus*. This has a more elongated and relatively narrow foliage, but the same texture, pubescence and whiteness beneath. It is an interesting fact that all the discoverable connections of the novel and interesting flora of the islands off Santa Barbara are with Mexico rather than with California. Upon the mainland mountains behind Santa Barbara is another *Ceanothus* of arborescent growth, in habit like a Wild Plum-tree. In late February its head is a mass of white bloom, so great is the profusion of small clusters of flowers on every branch and twig. This is *C. megacarpus*, a sort so rare as to have been but seldom seen even by a botanist. It may, perhaps, not be infrequent along the higher summits of mountains in the unexplored districts of southern California.

Among shrubby species of *Ceanothus* is the surpassingly pretty *C. foliosus*, with very small crisped or almost curled foliage of the darkest green, which is half-hidden at flowering-time under the many small, roundish stalked clusters of indigo-blue. It is only a foot or two in height, but with countless widespread branches, so that it forms a dense low thicket, almost completely covering the mountain-slopes in its own peculiar region, the foot-hills of Mt. St. Helena of the inner Coast-range. At the lowest elevations, just bordering the Napa valley, in the same general district, we have a somewhat closely related, but large and graceful, blue-flowered sort in *C. Parryi*, the original specimens of which were obtained by Dr. Parry from the shrubbery in front of a vineyardist's residence, whose good taste had left to them their foothold on the soil when other bushes had been cleared away. It is quite common in that region.

It is not possible, in a short account, to make special mention of more than one in ten of the entire list of Californian *Ceanothus*, though almost all are beautiful. But I am unwilling to conclude without speaking of two of the humbler sorts which adorn each its own place in the woods of the Sierra Nevada. In the heart of the great Pine district of the middle Sierra, a slender, low, half-trailing species, *C. diversifolius*, is singular in that it covers the ground throughout extensive open forests with a perennial verdure; and this is saying much for any plant in the middle mountains, where the forests in the main have no undergrowth which is not as short-lived as the rainy season of the year, and when all through the months of summer and autumn everything under the Pines and Redwoods is as brown and sere as upon the open plains below. *C. diversifolius*, wrongly called *C. decumbens* in older books, is semi-herbaceous, with broad, thin, soft foliage, and in all but its trailing habit and blue flowers is much like the familiar eastern species, *C. Americanus*. *C. Americanus*, by the way, as it now blooms in our university garden, is apparently quite at home on this side of the continent, and no white-flowered Californian species is prettier. In the Sierra, at higher elevations than are reached by *C. diversifolius*, grows a stout, prostrate, densely matted *Ceanothus*, with evergreen, prickly foliage and rather inconspicuous blue flowers, forming usually a close carpet under the trees. The school-children in mountain districts call it Squaw Mats, or Mahala Mats, the old Hebrew name Mahala having become for some reason the popular designation of the feminine membership of the Digger Indian tribe. The shrub is evergreen and very hardy, as well as compact and low, and has been spoken of as possibly useful for hiding the summer brown of unirrigated knolls and slopes in parks and other places along the seaboard. No experiments that I know of have been made. But, as the home of this unique *Ceanothus* (*C. prostratus*) is on the

shaded and cool elevations of elevated parts of the Sierra, I doubt if it would succeed on exposed places in a climate so different as that of the Coast-hills and plains.

University of California.

Edward L. Greene.

The Polemoniaceæ of the Lake Region.

NINE species belonging to the Polemonium family are indigenous to the region of the great lakes. They represent two genera, Phlox and Polemonium. Besides these, *Gilia coronopifolia*, the standing Cypress of the garden, a native of the southern states, is reported as an escape from cultivation on the north shore of Lake Erie. These are all that I can ascertain as included within the limits, though one or two species of Phlox may be found within the southern border.

Taking the Phloxes about as they flower, the first to appear in the region of the upper lakes is *Phlox bifida*, or Beck's *Lychnidia*. It is apparently confined to Illinois and the western part of Indiana. It comes into the lake region at the head of Lake Michigan, being found in the narrow belt of sandy land which encircles it. Here it is not uncommon in open, grassy places in the woods, or along their margins. I have never seen it at any distance from the woods, though it is called a plant of the prairie. It likes a dry soil, where the most common plants of the season associated with it are *Ranunculus fascicularis*, *Viola pedata*, *Oxalis violacea* and *Claytonia virginica*. It comes into bloom near the end of April, and lasts till the early part of June. *Phlox bifida* is of a diffuse and prostrate habit, the main stem frequently half-hardy and persisting through the winter under a covering of dried grass and leaves. Hence the plants may be disfigured at the time of flowering by the partially dead leaves of the preceding year. The stems are from three to eight or ten inches long, provided with several erect or ascending branches, three or four inches high. The pale purple or white flowers are so abundant as to largely conceal the foliage and cover the ground when growing close together with a carpet of bloom. The lobes of the corolla are wedge-shaped, each deeply cleft into two oblong divisions, giving to the limb a ten-rayed outline. At the base of each lobe are usually two more deeply colored blue or purple spots, sometimes uniting to form a ring with a raised point for each segment, forming a pretty eye to the flower. The slender tube is quite uniform in color, of a bluish purple tinge. But the limb varies considerably, from white to various shades of purple. Those found near Chicago are prevailingly white, at least when the flowers open, though they may become colored with age, or when picked and placed in a vase change to purple or even to blue.

P. bifida is a western representative of the better-known and much more widely distributed *P. subulata*, or Moss Pink, of localities east and south. The western limit of the Moss Pink is in Indiana, where it comes into the neighborhood of *P. bifida* in the vicinity of Lafayette. In the lake region it extends from western New York, through Ontario, to southern Michigan. It is also a plant of dry locations, generally growing in sandy or rocky soil. Being an evergreen, the creeping and matted stems and assurgent branches have a brighter look than those of *P. bifida*. The segments of the corolla are obcordate, or slightly notched, but are sometimes entire, and the flowers lack the radiate appearance seen in those of *P. bifida*. They are about as variable in color, the wild forms showing pink, pale rose, purple and white shades, usually with a darker centre. The depressed mats and cushions of plants are covered with flowers in May and June, and enliven many stretches of sand or chert or thinly coated rock with beautiful splashes of color.

The earliest of the taller Phloxes is *P. divaricata*. It starts a little later than the two preceding, its period of inflorescence being mostly limited to May and early June. Then the damp rich woodlands where it grows are bright with the large and fragrant flowers, often massed in extensive beds. It is a profuse bloomer, displaying from ten to twenty flowers at once in its showy, corymbose cymes. The stems are from one to two feet high, the lower part smooth and often colored with purple; the upper part, with the peduncles and calyx of the flowers, is glandular pubescent. The leaves are but slightly glandular, becoming smooth and somewhat glossy with age. After the flowers are gone, and especially in the early fall when the floral stems have disappeared, the barren, summer shoots springing from the root are a pleasing feature to be met with in the shady woods. Then these prostrate stems, bearing rather short, sessile, ovate leaves somewhat whorled at their ends, and with a shining half-evergreen look, strikingly resemble those of the pretty Fringed Polygala, and may be mistaken for that plant.

The flowers of *P. divaricata* are among the largest in the genus, being from an inch to an inch and a half across. Many shades occur, prevailingly those with a bluish tinge. The most common are bluish purple, purple, pale or deep lilac, pink, white, or white tinged with blue or pink. The large flowers, their delicious odor, and the deep green of the shapely leaves, make this one of the most charming of the wild Phloxes. It is the most widely spread of any in the Lake region, extending throughout except in the extreme northern part. It goes as far east as Qwebe, the most easterly range of any of the native Phloxes. South of this region it is very common.

P. pilosa is found from the head of Lake Erie to the Saskatchewan, and south-eastward to the Gulf of Mexico and the Atlantic. It accommodates itself to a wider range of soil and other conditions than the rest of the Phloxes of the region—from quite dry sand to the damp, rich soil of the prairie. It is the only Phlox common in the Pine Barrens. It is a denizen of the meadow, the copse and the open wood. The flowers appear a little later than those of *P. divaricata*, and continue till the middle of July or even later. The whole plant is hairy, the upper part, especially the branches and pedicels of the broad cymes, very glandular-pubescent, so that light bodies adhere to them, and small insects are held fast, as in species of *Silene* and *Pentstemon*. The linear, or lanceolate, leaves are very sharp-pointed. The corolla lobes are from round-obovate to oblong, and each is marked at the base with brownish purple spots, forming a handsome eye. The predominating colors are red, but white is not at all rare. The present year the white flowers were in excess at the opening of the season, the brighter ones coming in later. This may have been due to the unusual number of cloudy and rainy days, since the phenomenon was exceptional, and the colored kinds suddenly replaced the white ones when the days became warm and sunny. The most common floral tints are rose, bright pink to nearly red, rose-purple, pale blue and lilac, all shading into one another and into white, in almost endless variety. When the plants are massed in spots scattered about in the damp prairie, sometimes so thickly covering the ground that little else is seen, and in areas to be measured by the acre, they furnish the eye with the richest glow of color, and in brightness verify the fitness of the name, Phlox, which means a flame.

From the latter part of June well on into August *P. glaberrima* is the most common Phlox of the prairies or the open woods and their sunny borders; usually in moist grassy localities, or where there is enough of sunlight for grass to grow freely. It is essentially a prairie or meadow Phlox. The plants are very smooth, and of a pale but glossy green. They are from one to four feet high. The slender stems, stretching up among the grass, lift the bunches of flowers, from three to six or eight inches long, well into the sunlight. The leaves are long and very narrow, and the pairs are so far apart upon the stem as to give it a naked look. The plants are often massed in extensive beds, but their pink flowers are less striking than those of *P. pilosa*. The lobes of the corolla are quite uniformly roundish, and the flowers in form and size are more nearly like those of *P. Drummondii* than in most of our wild species, but lack their richness of color. There is often a deeper-colored pink or reddish line traced upon each lobe, a five-rayed star on a paler ground, or the lobes may have a white or pale base pervaded by a red crenellated line.

Two of the panicled Phloxes are represented in the lake flora—*P. paniculata* and *P. maculata*. They are mainly southern in their range, coming into the lake-region south of Lake Erie and Lake Michigan. *P. maculata* is native as far north as southern Minnesota. As both are often cultivated they readily escape, and may be more widely spread in consequence. The wild plants are sparsely found in northern Illinois in rich woods and by the shaded banks of streams.

Polemonium is represented by one species, *P. reptans*, the Greek Valerian, often cultivated. It is found from western New York to central Minnesota and southward. It is most plentiful in the rich open woods and along their borders, as it does not like dense shade. Some of the finest plants may be seen in clearings, where it flourishes among the litter, or are found persisting by the fence-rows lined with brambles and Hazel. The diffuse stems, ten to twenty inches long, with several often rising from a single root, and the pinnate leaves, with their three to ten pairs of ovate or oblong leaflets, form handsome clumps of lively green. When richly furnished with flowers in May and June, few plants of the woods are more attractive. The short tube and flaring limb make the flowers somewhat bell-shaped, and from this, with the color, they are generally known as Bluebells by country people. They have a light blue color, varying toward lilac, either sky-blue, or more often that peculiar restful shade which the French

have named bleu d'œil, eye-blue. White flowers are also found.

All of these plants are easy to cultivate, and, if not already in the garden, deserve a place there. Trials with *Phlox pilosa* show that the flowers increase in size and number, and in richness of color, when transferred to a garden-soil. The wide range of soil and exposure to which it adapts itself in its natural condition is also greatly in its favor. They are mostly plants of the open field, delighting in the full sunlight, though some, like *P. divaricata* and the Greek Valerian, need or do best in partial shade, the former bearing that which is quite dense. Since all spontaneously bear white flowers, the range of color between white and the red and cyanic series show the possibilities of variation in the hands of the skillful gardener. This has not only been demonstrated in the Texan annual, *Phlox Drummondii*, whose beauty and endlessly varied colors all admire for a bedding-plant, but is shown in the northern perennial, *P. paniculata*, and its variety or synonym, *P. decussata* or *acuminata*, and the crosses between these and *P. pyramidalis*, which the best authorities identify with *P. maculata*.

Englewood, Chicago, Ill.

E. J. Hill.

Foreign Correspondence.

London Letter.

THE exhibitions and conferences at the Royal Horticultural Gardens at Chiswick on Begonias, hardy Ferns, Apricots and Plums, were succeeded by a large and important exhibition of high-class fruit at the so-called International Horticultural Exhibition at Earl's Court, where a horticultural display, strangely enough, was united with the "Buffalo Bill" show.

An exhibition such as that at Chiswick, with the remarkable gathering of Begonias and Ferns, could hardly be seen anywhere but in London. An enormous collection of species of cultivated Begonias came from Kew, with splendid productions from the two great Begonia raisers, Messrs. Laing and Messrs. Cannell. Probably never before have so many species, well grown and correctly named, been seen at one exhibition. But, interesting as this collection of species was, attention was centred in the small group of species which constituted the primitive forms. From these have been created, with phenomenal rapidity, the splendid races of double and single tuberous Begonias, perhaps, at the present day, the most popular class of greenhouse-plants in this country. Mr. Veitch, in an able address embodying the more salient points in the history of florists' Begonias, gave an account of how the race had its origin in the now neglected *B. Boliviensis*, a species of graceful growth and brilliant flower color, and the small *B. Pearcei*, with bright yellow flowers and exquisitely mottled foliage. From South America came *B. Veitchi* and *B. rosæflora*, which were immediately seized upon by hybridists, and the intercrossing continued until the features of the original parents became so blended that now it is a difficult matter to trace the peculiar characteristics of the primitive species. The contrast between these and the finest productions of Laing and Cannell fully justified the remark that the Begonias of to-day are among the most conspicuous triumphs of English floriculture. And this triumph is peculiarly English, for no foreigner took an active part in its production during the early experiments. The exhibits of Cannell and Laing, who both had marvelous displays of flowers and plants, showed the florists' Begonia up to date, for they both had their latest seedlings in doubles and singles. It is probable that the range of possible tints in Begonias has been exhausted, but Mr. Laing is sanguine of extending the gamut of hues by persistent crossing, and he hopes, moreover, to get a strain with variety of petal markings. He has already Picotee-edged single varieties, and one specimen at Chiswick had broad pure white petals broadly edged with carmine, a most striking variety. While many think that the Begonia is not improved in being cultivated into "six-inch singles" and "Hollyhock doubles," as long as the public admire them and buy them the florists will continue to supply these novelties.

What is now wanted is a new species that will blend with the present race of hybrids and add to it new characters, and such a desideratum may be expected among the new discoveries in Africa and other unexplored regions. When, a few years ago, the island of Socotra yielded its solitary Begonia through Professor Balfour to the English florist, it was immediately put to use in hybridizing, the result being a race of very pretty varieties, especially valuable, as they flower through the winter, those named John Heal and Winter Gem being among the first raised. The fine-foliaged Begonias have of late years had more attention paid to them, and the Continental hybridists have produced some distinct and handsome kinds, such as Arthur Malet. There is an astonishing range of variation in the Begonias of the Rex or fine-foliage type, and in all probability we may see soon the gorgeous flowers of the tuberous section combined with ornamental leafage. Nor has the fibrous-rooted section of the genus, which comprises the bulk of the species, been worked upon much, and some good things may come from their influence. Mr. Watson told us, in introducing the paper he had prepared on the cultivated species, that there are about 400 species of Begonia known, and about half the number are in cultivation at Kew, a large proportion of them being shown on this occasion.

The gathering of highly cultivated specimens of hardy Ferns has seldom, if ever, been surpassed in excellence at a London show, and this was mainly brought about by the well-known hardy Fern specialist, Mr. E. J. Lowe, who was instrumental in bringing the unique collection from the Clifton Zoological Gardens, many of the plants in which were in huge pots, and the plants measuring a yard or more across. I had never before seen such a fine collection, and never before realized the fact that the finest forms of hardy British Ferns are in no respect inferior to tropical kinds we admire in hot-houses. Some, indeed, are equal in elegance and texture of frond to the Todeas, among Filmy Ferns, and others, such as the variety of *Polypodium vulgare* called *Trichomanoides*, as fine as some of the *Trichomanes* and *Hymenophyllums*, apart from their transparency. The wonderful amount of variety among the forms of *Scolopendrium vulgare* (Hart's-tongue), *Lastræa filix-mas* (Male Fern) and *Athyrium filix-fœmina* (Lady Fern) seemed to surprise all who were not specialists in hardy Ferns. The collecting of these varieties has been done for the most part by amateurs in a very quiet way, particularly in the western counties, so that Londoners have not had an opportunity of seeing what a wealth of beauty there is in hardy Ferns. I can see that it is quite possible to have in an unheated fernery all the beauty of form possible in a tropical fernery, not even excepting the delicate Maiden-hair Ferns, for the forms of *Adiantum Capillus-veneris* are quite as beautiful as the tropical kinds, while miniature Tree Ferns may be made of some forms of *Lastræa*, as some specimens with clear stems of a foot or more were shown on this occasion.

The late-flowering trees and shrubs, of which we have far too few, now begin to give glints of color to the arboretum, and at Kew the old trees of *Sophora Japonica* are snowy with bloom, as is also *Catalpa bignonioides*, which, though it flowers well on the dry gravelly soil, is not nearly so fine as further down the Thames valley. In the neighborhood of Pope's Villa at Twickenham there are some magnificent groups of the tree in full bloom, their great branches leaning over and almost touching the water. Some of the trees are forty feet high, and have as fine heads as any I have seen in southern Europe. *C. speciosa* is becoming widely distributed, but as yet our tree-planters are not as familiar with its merits as you are in America.

The *Paulownia imperialis* is not a tree for general planting in England, except, perhaps, along the south coast; but I saw the other day some fine effects obtained by treating it as a "sub-tropical" plant, as is sometimes done in America; the foliage of the strong young shoots was very

massive, and associated with other fine-leaved plants such as *Cannas* and *Ricinus*. The plants are cut down every autumn, and in spring they send up vigorous shoots, which are thinned out to three or four, and furnish a mass of immense leaves all summer. To see the *Paulownia* to perfection in Europe one must go to the sunny south, and I have a pleasing recollection while writing this of the magnificent avenues I saw of it in full flower at the end of April in the gardens of the Villa Borghese and the Pincian Hill at Rome, where the climate exactly suits it. Among other interesting things in the arboretum are the *Ceanothuses*, the French hybrid varieties of *C. azureus*, of which there are several in nurseries, but none so fine as the oldest

large as *L. purpurata*, with broad (not reflexing) sepals of pure white, and a lip painted with brilliant tints of purple and crimson. Messrs. Sander also had fine examples of autumn-flowering Orchids, and especially of that noblest of all *Vandas*, *V. Sanderiana*, which seems to have dropped out of notice until lately it has been shown splendidly from St. Albans. It would be interesting to find out (if it were possible) how many plants of the original importation of *V. Sanderiana* are alive now. The hundreds, and perhaps thousands, that were distributed to all parts, not a few to your American collections, would surely have been more in evidence at exhibitions than they have been if it flourished as most growers thought it would. In addition



Fig. 74.—White Oak, near Bedford, Westchester County, New York.—See page 446.

Gloire des Versailles, with its pale purple-blue plumes of flowers. The finest dwarf autumn shrub is the new *Hypericum Moserianum*, a cross between *H. calycinum* and *H. patulum*, between which species the hybrid is exactly intermediate. It has large shallow flowers of bright yellow, with tufts of crimson-lipped stamens. It flowers profusely and continuously, and, in short, is quite a gem among hardy flowering shrubs. The florists, too, have found out that it forces well, and can be had in bloom early in the spring, so that will tend to popularize it more.

At the Earl's Court Exhibition a fine Orchid from the St. Albans Nurseries was *Lælia Gravesiæ*, a hybrid between *L. crispa* and *L. purpurata*. It is an exquisite flower, as

to the cream of the autumn-blooming Orchids, Messrs. Williams, of Holloway, had some new plants and Orchids, the latter including the rare little *Pachystoma Thompsonianum*, which received a first-class certificate, though it has been in gardens for years. The new plants included among *Dracænas*, *D. indivisa Veitchi variegata*, a cumbrous name for an elegant plant with narrow leaves striped with yellow, and which will, no doubt, be a popular decorative plant in course of time. Other new *Dracænas* of the ordinary reddish-leaved type were Miss Glendinning, Mrs. Laird, H. E. Milner and A. Laing, to which first-class certificates of merit were awarded. *Carludovica palmæfolia* and *Cupania elegantissima* were two elegant plants for decora-

tive use in Messrs. Williams' group. The great floral feature of the show, however, was the Begonia trophy of Messrs. Laing, who quite surpassed themselves. Never before at any show has such a marvelous array of double and single Begonias been seen. They were arranged in a rising bank with a background of Palms and other foliage, and disposed in groups of one color a yard or so square; the effect was brilliant in the extreme. The colors ranged from pure white through pale and deep yellows and warm orange up to the most intense scarlets and crimsons. The gold medal won by the exhibitors was highly merited.

Kew.

W. Goldring.

Cultural Department.

The Self-pollination of the Grape.

THE Grape has small greenish blossoms which open in a peculiar and interesting way, and protect the stigmas from outside pollen till they have opportunity to become self-fertilized. The petals form a kind of cap which covers the sexual organs. When the flower opens the petals break away from their attachment at the base, but remain fastened to each other at the top, thus keeping the stigma and anthers covered. Finally the petals curve outward from the base and upward, and the expansion of the stamens usually dislodges the cap. In the nearly related genera, *Cissus* and *Ampelopsis*, the petals open at the top and expand in the usual way. The calyx in all *Vitaceæ* is practically obsolete, and plays no part in the opening of the flower.

An opening bud is shown in Figure 75; *a* being a petal just detached at the base, and curved outward, disclosing a portion of a filament (*b*), and the outline of a part of the pistil. Figure 76 shows the pistil with the cap removed, and illustrates the expansion of the different forms of stamens. If the flower has short filaments, as at *a*, they become reclined (*b*), or recurved (*c*). If the flower has long filaments (*d*) they become erect, as at *e*. This structure of the Grape-flower is of practical interest to the grower, and we are glad to give a study of the subject in a paper read before the American Association for the Advancement of Science at its meeting in Rochester last month by Professor S. A. Beach, of the New York State Experiment Station.

The best time for examining Grape-buds, to find out whether self-pollination takes place before the flower opens, is just at the time when dehiscence of the corolla begins. Dehiscence usually begins at the base of one of the petals, and extends upward half or two-thirds of its length. Afterward the straightening up of the stamens, if they have long filaments, or the reclining or recurving of the stamens, if they have short filaments, dislodges the calyx, or cap, as it is frequently called, and carries it upward and to one side, thus uncovering the

dehiscence of the corolla allows the moisture to escape from the open anthers, and the pollen, becoming dry, is discharged abundantly on the pistil before the cap is displaced, thus insuring self-pollination before the stigma is exposed to foreign pollen.



Fig. 77.—Two clusters of the Lindley Grape from the same vine, with abortive fruits showing lack of proper pollination.

In every instance when buds could be found in the right stage of development it was observed that self-pollination occurred before the blossoms opened. The total number of individuals in which self-pollination was thus observed is seventy-seven, distributed among eight species and their hybrids and crosses. Several other varieties were examined without being able to demonstrate that self-fertilization occurs before the blossoms open, but in no case was this true when buds could be found at the proper stage of development above noted, namely, just beginning dehiscence.

Clusters of grapes were inclosed in paper bags before the blossoms opened and were allowed to remain covered until the blossoming period had passed. This effectually shut out foreign pollen and made it possible for the stigmas to be pollinized only by pollen from stamens of the same flower or of the same cluster. Some results of these tests may be briefly summarized as follows:

Of four cultural varieties having pure *Labrusca* blood, three were found to be fully self-fertile, and the fourth nearly so. Their stamens in every case are borne on long filaments and self-pollination occurs before the blossoms open.

Of seventeen hybrids of *Vitis labrusca* and *V. vinifera*, three were fully self-fertile. These have long filaments. Whether self-pollination occurred before the blossoms opened was not noted. Another one, though not fully self-fertile, still developed a large per cent. of the ovaries into perfect fruit. It has long filaments. Self-pollination occurs before its blossoms open. Eleven proved to have pollen self-irritant only—that is, the ovaries started to develop and soon fell away or persisted as abortive fruits. Ten of these have short filaments. The character of filaments of the eleventh one was not noted. Self-pollination was observed with seven of this class. Whether it occurs with the other four cannot be stated. One proved to have pollen impotent—that is, the ovaries were not incited to any perceptible growth. It has short filaments and self-pollination occurs before the blossoms open.

One cross of *V. labrusca* having *vinifera* blood was found

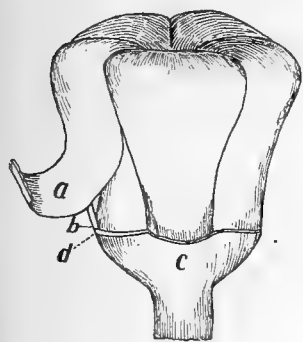


Fig. 75.—The Opening Bud of a Grape-flower.

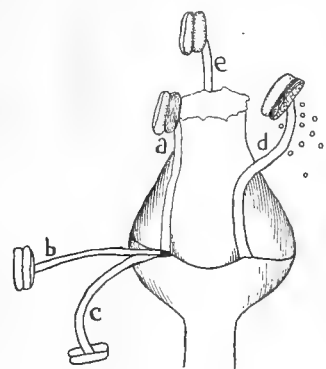


Fig. 76.—Pistil and Stamens of a Grape-flower.

stigma. Occasionally the filaments fail to perform this work, and the cap persists for an indefinite period, as a withered covering on the apex of the young fruit.

The anthers are already opened when dehiscence begins, but the pollen has not yet been discharged from them. The de-

to have pollen self-irritant only. It has short filaments. With this cross and the seventeen hybrids of *V. labrusca* and *V. vinifera* above noted, none but those varieties having long filaments can develop fruit when self-fertilized only. In every instance the vines with short filaments were really pistillate since they failed to develop fruit when self-fertilized only. According to Munson this is commonly true of wild bearing vines of all species of *Vitis*. A specimen of *V. æstivalis* transplanted to the vineyard has long filaments and proves to be fully self-fertile.

The Delaware, classed doubtfully as a hybrid of *V. vinifera* and *V. riparia*, has long filaments and is fully self-fertile.

Vitis Doaniana, as represented by a specimen transplanted to the vineyard, has pollen self-irritant only, and self-fertilization occurs before the flower opens, but fails to produce fruit.

Pollen that is self-impotent or self-irritant only may prove potent on other varieties. This was found to be true with two of the seventeen hybrids of *V. labrusca* and *V. vinifera* above noted.

These experiments show that under the conditions of soil and climate found at Geneva, New York, any one of the following list of grapes will probably prove unfruitful when planted by themselves out of the reach of pollen from other varieties: Massasoit (Rogers No. 3), Wilder (Rogers No. 4), Rogers No. 5, Gaertner (Rogers No. 14), Merrimack (Rogers No. 19), Requa (Rogers No. 28), Aminia (Rogers No. 39), Essex (Rogers No. 41), Barry (Rogers No. 43), Herbert (Rogers No. 44), Salem (Rogers No. 53), Black Eagle, Eumelan and Brighton.

The following hybrids are able to fruit without the aid of pollen from other varieties: Rogers No. 13, Agawam (Rogers No. 15), Rogers No. 24, Rogers No. 32 and Delaware.

Notes on Begonias.

BEGONIA *Boliviensis* Madelaine is one of the new plants of the season introduced by a French house. This varies from the type only in having flowers of a different shade of red, they being dull carmine or bluish red, while those of the original plants are a light vermilion. They are of the same thin texture as the type. *B. Boliviensis* is probably little grown now, but it is a very attractive species with its *Fuchsia*-like habit. As one of the first introductions of tuberous *Begonia* and one of the parents of the first hybrid *Begonia*, it has always been an interesting plant to fanciers aside from its beauty. From this species the first of the double-flowering hybrids were produced, and growers of these plants from seed will often find among the seedlings many showing a trace of *B. Boliviensis* in the long narrow leaves and long lax peduncles. It is only a few years since that the majority of the plants from seed of double kinds supplied by the leading growers, were largely only variations of this type. The present race of hybrids, however, has reached a stage where little trace of *B. Boliviensis* can be found. The flowers are now wide open, round or nearly so, the plants dwarf and the flower-stems perfectly rigid. While it is pleasant to follow flower fashions, it is sometimes pleasant also to retain plants which have a distinct character different from those in special vogue, and *B. Boliviensis* is one of the most distinct and graceful of the family.

Begonia pictavensis is a hybrid between *B. Scharffiana* and *B. metallica*. It proves to be a strong-growing plant of not very much character in the foliage, which resembles mostly that of *B. metallica* without its dark veinings, which are so attractive, and they are of thicker substance without the richness of those of *B. Scharffiana*. The flowers are large and pure white, studded on the reverse of the petals with numerous rosy hairs of a beautiful hue. A cluster of these is very attractive, and they give value to a plant otherwise not especially a great gain. It will be seen that the flowers, while not so large, are of the character of those of *B. Scharffiana*, and they open more freely than those of this variety, though under some conditions *B. Scharffiana* is very free and does not maintain its reputation as a producer of imperfect flowers. *B. pictavensis* is also known as *B. Credneri*.

Begonia Vernon (*B. semperflorens atropurpurea*) has proven to be a very satisfactory bedding-plant during a specially hot, dry season. It is always in flower, and these are perfectly weather-proof, rains having no effect with them. The leaves have not scorched under the blazing sun. The purplish tinge in these is very variable, increasing and diminishing during the season, but always giving a rich and distinct effect in masses. As this is a plant quickly propagated it is likely to grow in favor where low-growing neat bedding-plants are useful.

Elizabeth, N. J.

♀. N. G.

Cape Oxalis.—II.

THE prevalent idea is that the *Oxalis* is a trifoliate plant, having foliage much resembling that of the White Clover, and some of the early botanists named it *Trifolium*, being acquainted only with the three-leaved kinds, such as *O. acetosella* and *O. stricta*, found in the greater part of Europe and America. The species of which I mean to speak are of a very different appearance as, in place of being nearly or quite stemless, they have stems a foot or more in length, along which the small leaves are scattered, the whole plant having, indeed, much the appearance of a Cranberry-plant.

How many of these are distinct species I shall not attempt to say, but as garden-plants there is a considerable diversity of appearance. The bulbs of all of this section are of a light salmon-color, broad at the base and sharp-pointed at the other end. They are usually sold of a size too small to flower well. A good bulb of *O. hirta* or *O. rosacea* should be as large as a small Tulip-bulb. These species generally flower very freely for a considerable time and then cease altogether, but they are not unornamental when out of bloom if placed among other plants where their drooping habit gives variety. All of them produce bulbs freely at the root and may also be propagated by cuttings. *O. macrostylus* is a species with rather dull purple flowers, three-fourths of an inch across, but with rather narrow petals. It is not very desirable, since there are many brighter kinds. A bulb of this variety should be as large as a filbert. The stems are generally not more than nine inches long. The flower of *O. hirta* is bright red, not bluish purple as in Jacquin's figure, which seems to have faded in the course of the century which has elapsed since it was printed. This is quite commonly offered in the catalogues yet, and is a very desirable kind, though the bulbs furnished are almost always too small. *O. hirtella* is much like *O. hirta* in all respects. The color is somewhat purplish, however.

Oxalis multiflora is well named, for its blossoms are more numerous than in any other species of this section. They are about three-fourths of an inch across, of a lilac color with yellow throat, and are borne upon long side-shoots emitted from the main stem from nearly every axil, so that the plant has a thick, bushy appearance. I recommend this as an excellent pot-plant. *O. rubella* is also very good; its flower is brighter than that of any other variety, except *O. fulgida*, which is somewhat less floriferous though more brilliant.

Oxalis rosacea has the largest flowers and the largest bulbs of the section, the former being frequently two inches in diameter, light purple with yellow tube. Both in size and in color they are much unlike Jacquin's figure. The only other species of this section which I have grown is *O. canescens*, which is of smaller growth than most of the others, and produces rather small lilac flowers very profusely and is a very good kind for pot-culture.

Canton, Mass.

W. E. Endicott.

Kämpfer's Iris.

THIS Iris is more correctly called *Iris lævigata*, but is better known as *I. Kämpferi* in gardens of to-day. These plants seem, in common with many other gems from Japan, specially adapted to American gardens. They like the sun, cold does not hurt them, and their only enemy is the rose-bug, which infests the plant during the blossoming-season. It is surprising that these Irises are not more common in gardens, since failure is possible only when the roots have not been supplied with sufficient moisture, and, indeed, they may be grown successfully as sub-aquatic plants, for if covered with ice through the winter they come out in the spring all the stronger for their stern discipline. They like best mud or a rich black soil, though they can be made to grow in the poorest soil if plentifully supplied with moisture through the summer months. They are at their best in July. There are no flowers in the hardy flower-garden through the whole season which surpass them in beauty, and it is probably to this fact that they owe their popular name of Poor Man's Orchids. The best time to plant the Japan Irises is in the fall. When the foliage begins to turn yellow they may be divided and reset. Care must be taken to give them rich soil, as they are permanent plants, and need lifting only when the clumps get too large and are starved by remaining too long in one place. The best way to divide them is to lift carefully, and use the spading-fork to separate, not cut, the plants asunder. Treated in this way they will grow stronger and flower more freely the next season. These Irises may also be planted safely in spring if grown in one's own garden, and needing transference only from one position to another; but when the plants are obtained from a distance

it is safest to procure them in the fall, as they start to grow early in the spring, and one locality varies much from another, both in the time when plants are in active growth and the time when it is possible to plant them elsewhere. Both to those who have already a collection of Japan Irises, and to those who have none, the question of what sorts to plant is of great interest, for when they were introduced to the United States and Europe, varieties were, of course, named in each country, according to the fancy of the possessor, so that we can buy sets from different dealers and stand a good chance of getting duplicates though a different name be attached. In order to avoid this it is best to make a selection at flowering-time, as growers of hardy plants are usually glad to send cut flowers of different varieties for selection. In making a collection it is best to avoid the plants which produce flowers of large diameter, as the petals of such flowers lack substance. Preference should be given to plants producing flowers of good substance or the double-flowered varieties, the blossoms of which last are beautiful and durable when cut. When buying from a catalogue the mixed varieties must be avoided. It is better far to pay the price and get good ones to start with, and then by careful selection and seed-saving to raise seedlings at home, which will flower when two years old if the seed be sown in boxes when ripe, brought on in the greenhouse in spring, transplanted when large enough indoors, and later in the open ground. Plants thus treated will all flower, and the poorest of them will be better than low-priced kinds. Indeed, I have raised as good double varieties from seed as could be found among forty sorts imported from Japan.

As with many other plants, the more highly developed the flowers the less of seed we get, and the double varieties of Iris produce seed sparingly. The seed should be gathered when ripe and taken out of the capsule and cleaned, as there is a small worm that finds these seeds a comfortable place for winter quarters, feeding upon their substance as the days shorten.

The poor varieties weeded out from a lot of seedlings should not be thrown away, as they are admirably adapted for naturalizing in waste places where the soil is moist. In such positions the Japan Iris will hold its own against all other plants or weeds, and will flower year after year and reproduce itself from seed. Another point worthy of remark is, that when transplanting in the fall we should resist the temptation to cut off the foliage. The mature grass-like leaves are a great protection to the dormant buds below, and where appearances are not studied too closely the foliage should remain on the plants all winter, more especially if they have been moved, and the same remark applies to many other plants, such as *Eulalia*, *Arundo donax* and all Lilies.

South Lancaster, Mass.

E. O. Orpet.

Eschscholtzia Californica.

AMONG the most satisfactory annual plants, either for outdoor cultivation or for forcing, are *Eschscholtzia Californica* and its variety *crocea*. The plants are very easily grown and are most profuse bloomers, the bright orange or yellow flowers forming one of the most conspicuous spots in the garden. The seed may be sown out-of-doors in May, but plants started under glass early in April are more satisfactory, as they mature so much earlier and will often begin to bloom before the hot weather of August sets in. The blossoms appear most freely in cool weather, and in this locality are usually at their best when cut by frost in September. If the seed-pods are removed as soon as formed, the period of blooming may be prolonged almost indefinitely, provided the plants are protected. I have had plants to give a profusion of blossoms for more than two months. If the pods are not removed, however, the vitality of the plant is taxed to develop seed and the later blossoms are small and inferior.

Two or three plants which I had in the greenhouse last winter attracted much attention. In October, after frost had destroyed most of the plants, some young seedlings were removed to the house. They were shifted as needed, and finally, in four and a half-inch pots, were plunged in earth in a cool house, with a night temperature fifty degrees. From the first of March until June, when the house was cleared, the plants bloomed freely and continuously. Two of the plants, when at their best, had more than one hundred open blossoms at once, and the effect was most pleasing.

The chief objection to the *Eschscholtzia* for cutting is its habit of closing the petals at night. The blossoms last several days, however, and I have found them more satisfactory, and less inclined to close at night, the second or third day after cutting than the first. I have a vase filled with the flowers before me

as I write, and though they have been cut four days they are as bright now as when first cut. This plant should be more widely cultivated and more generally found in home gardens.

Orono, Maine.

W. M. Munson.

Correspondence.

Autumn Flowers at Passaic, New Jersey.

To the Editor of GARDEN AND FOREST:

Sir,—A good example of the Olcott system of making lawn was seen at Woolsons & Co.'s nursery a few days since. Pedigree grass-growing, as it is called, consists in sowing the purest available grass-seed in a sheltered place, as in a frame, where it is carefully cultivated and weeded from all rogues or foreign varieties. The true plats thus produced are cut up into small pieces, from one-quarter to one-half inch in diameter, and planted at some distance apart—in this case nine inches—in carefully prepared ground, to tiller out and fill out the lawn. The lawn here seen was a variety of *Agrostis*, planted about the middle of May, and now showing a nearly perfect mat of a uniform green. Apparently, the lawn only needed a rolling and the filling of a few vacancies, and was absolutely free from all but the one grass originally planted in small tufts. It will readily be believed that the initial weeding in the seed-bed is labor applied exactly in the right place, and the system seems as economical of labor as successful in producing a lawn of the species of grass desired.

Clematis paniculata, covering a wire trellis several hundred feet long, cannot be passed without note, though the plant has had its share of notice. It may be said, however, that among the numerous plants some were showing flowers larger than the type, but with all the elegance of the species. *C. Davidiana*, introduced a few years ago with some flourish, does not seem a plant likely to become popular, in spite of its "blue hyacinth-like flowers." Where space is not valuable it may have a certain value in the shrubbery, but its flowers are not very frequent or showy, and they are produced in the axils of the leaves and are practically stemless. The plant also has a certain interest as not being a climber as are most other members of the family. Other species in flower at the same time were *C. crispa*, *C. coccinea*, *C. flammula*, *C. stans*, *C. Viorna*, *C. tubulosa* and *C. Pierotti*.

Perennial Asters are interesting plants not nearly enough appreciated in our gardens. Unfortunately the names are very much mixed, and at present it is only by observing the plants in flower in nurseries that one can secure a collection without duplicates. The species here, such as *A. Novæ-Angliæ* and var. *rosea*, *Patmicoides*, *lævis*, *longifolius*, *bessarabicus*, *Herveyi*, etc., are said to have been identified by Asa Gray. The dwarf-growing Alpine Aster, which flowers in May, is one of the most satisfactory of the hardy Asters and should not be omitted from the choicest collection of hardy plants. Stokes' Aster (*Stokesia cyanosa*) was also in flower. This is an attractive composite with light purple flowers of beauty and distinctness, some three or four inches in diameter. A mass of *Plumbago Larpentæ*, with its neat foliage just beginning to take on bright tints, and covered with its rich blue flowers, reminds me that this is a plant which apparently revels in sunshine. In England, where it is much grown, there are frequent complaints of its doing badly and not flowering.

I noted many other beautiful flowers, *Anemone Japonica*, *Daphne Cneorum* (second bloom), *Veronicas*, *Tritomas*, *Sedums*, *Rudbeckias*, *Platycodons* and *Lobelias*, which add so much color to our gardens at this season, but whose glories will be eclipsed by the wonderful coloring which will soon surround us as ripening vegetation is suffused with autumnal tints.

Elizabeth, N. J.

J. N. Gerard.

Russian Fruits.

To the Editor of GARDEN AND FOREST:

Sir,—In your issue of August 3d, I notice in one of the always readable articles of your correspondent, Dr. Hoskins, a recommendation to the fruit-growers of New York to test the Russian fruits, especially the Apples, with a view to escape the troubles of apple-scab, etc.

This is commendable, because experiments are advisable in every business, especially if indulged in judiciously. The experience of others is an aid to individual judgment. The people of Iowa have tested the Russians zealously for about ten years; they have been urged and led along that path both by precept and example. In 1882 the new Russian fruits came, "a very great multitude," and in 1883-4 a series of disasters

nearly ruined the orchards of the state. Men were ripe for any trial that promised relief. Nurserymen eagerly stocked up with Russian fruit-trees of all sorts. Enterprising salesmen offered them at fancy prices, and everybody was ready to buy.

In an incredibly brief time the nurseries and orchards were testing the strangers. Now, in 1892, ten years from the start, a survey of the field is instructive. South of latitude forty-two degrees I know of no nursery offering Russian fruit-trees, except in a very limited way. Out of over three hundred varieties of Apples, I am propagating only two, and these more and more sparingly. Both are summer Apples, and, in my judgment, must disappear after a few more years, and their places be supplied with others. Cherries and Plums are in the same condition, the Pears nearly so. Whether at the end of another ten years anything but a memory of them will remain to southern Iowa is questionable.

Russian fruits are seldom seen in our markets. What have been offered have been of medium or poor quality. The trees in nursery and in orchard have suffered from various diseases, blight being most fatal. Nurserymen south of forty-two degrees have almost entirely ceased to grow them. North of that, the destruction and loss of credit have not been so great. In short, the whole matter rests upon that of locality, latitude and height above the sea. The centre of origin of the Russian fruits imported is in about fifty-five to sixty degrees of north latitude, and a change of ten or fifteen degrees of latitude is too much. Theory indicated this before the experiment, and experience has confirmed scientific prediction.

In the extreme north of New York Russian fruits may prove desirable. In the great fruit-belt south of forty-two degrees no experience justifies such a hope. The experience of Ellwanger & Barry at Rochester, of the Berckmans in New Jersey and of the very extensive and expensive trials in Iowa and adjoining states forbids it.

Des Moines, Ia.

C. L. Watrous.

Albino Orchids.

To the Editor of GARDEN AND FOREST:

Sir,—In your issue of August 17th one of your correspondents speaks of finding *Habenaria fimbriata* in its white form near Tannersville, New York. Perhaps it may interest her and others to know that I have found the same near North-east Harbor, Mount Desert, Maine.

Baltimore.

Mrs. Thomas Baxter Gresham.

California Roses.

To the Editor of GARDEN AND FOREST:

Sir,—There are few places, and perhaps none, in the Union where so many men of affairs devote their leisure to the cultivation of Roses as Oakland. The evidence of this can be seen any day in the abundance of cut roses which are carried across to the city. Many of these amateur cultivators are enthusiasts, and their conversation is apt to centre on the merits of some new or old Rose, for their collections include hundreds of distinct varieties.

That the Rose is well at home in California goes without saying. As a climber it goes skyward like a Wild Grape; as a standard it grows into trees eight and ten feet in height, with a stem fit for a handspike, and as a shrub it rivals in luxuriance the Willows by the brook-side. It requires, as a consequence, plenty of room here. If the directions given in books for other climates were followed, our Roses would be packed together like bristles in a brush.

Some Roses that have a good reputation in the east or abroad are of no value here, while some of our best kinds have little reputation elsewhere. Of the first class we may mention, among the Tea Roses, Marie Guillot, Madam Bravy and Etoile de Lyon; among the Hybrid Perpetuals, General Washington, Madam Charles Wood and Dinsmore, and among the Bourbons, Queen of Bedders and Appoline. Of the other class the following are a few examples: The Tea Rose Laurette, catalogued by only a few growers in the east, grows into a tree eight feet high, with a stem two and a half inches in diameter, in five years from the cutting, and its flowers are exceedingly bountiful, beautiful and constant. Reve d'Or, Noisette, is more valuable than Maréchal Niel. It is a wonderful grower, always in bloom, and the flowers lack but little of being as fine as those of Maréchal Niel. The little Polyantha Rose, Cecile Brunner, so lightly esteemed at the east that half the growers do not list it, within a few feet from where I am writing forms a hedge four feet high, and this would be much higher were it not cut back twice a year.

There is scarcely a month in the season when it is not a mass of bloom. The buds have few rivals for boutonnières, and the full-blown flowers, at least two inches across, are beautiful almost beyond comparison for decorative purposes. Our Italian florist says, "Everybody like-a de baby roses." Perle d'Or is a fit companion for Cecile Brunner, and the two are worth more here than all the rest of the Polyantha class.

Of course, the behavior of Roses is not uniform in California, for the state has such a wide range of altitude, latitude and longitude that it affords almost every variety of climate, from perpetual summer to eternal winter.

Oakland, Cal.

H. G. Pratt.

Cypripedium Edwardii.

To the Editor of GARDEN AND FOREST:

Sir,—A seedling *Cypripedium* of much interest has just flowered in the collection of Mr. H. Graves, Orange, New Jersey, which has been named *Cypripedium Edwardii*, in honor of the son of Mr. Graves. It is a cross between *C. superbians* and *C. Fairieanum*, and was raised by Messrs. Pitcher & Manda at the United States Nurseries.

The plant is very compact; leaves, about five inches long and one and one-half broad, rounded at the ends, deep green, faintly tessellated and glossy; scape, green, pubescent, erect, monoflorous; flower, large; dorsal sepal, two inches long, white, tinted with green at the base and vinous purple near margin, rayed and reticulated with green, many of the rays speckled with brown; petals, two and one-half inches long, undulated and drooping as in *C. Fairieanum*, margined with black hairs; the border is vinous purple speckled with black; centre, translucent, with parallel veins running from base to apex; basal third, thickly dotted with black; pouch, two inches long, narrow, pale green, with brighter reticulations dotted at base and on inside with vinous purple, shaded with brown on front; staminode, large, netted with bright green.

Orange, N. J.

Robert M. Grey.

Recent Publications.

Annals of Horticulture in North America for the year 1891. By L. H. Bailey. New York, The Rural Publishing Company.

All persons who take more than a superficial interest in horticulture will be grateful to Professor Bailey for this record of the labors of a year in his special field, and still more grateful for the assurance it gives that these volumes can hereafter be expected regularly. As the series grows it will be invaluable for reference, a treasury of horticultural knowledge, and a history, let us hope, of steadily growing interest and continued progress. Each of the volumes is much more than a mere witness of current events. The first one, for example, contains a list of kitchen-garden vegetables, and the most important piece of work in the present volume is the elaborate census of our native plants which are, or have been, cultivated.

An examination of the list, which covers sixty pages, will surprise most readers, for the extent to which our fields and woods have enriched the gardens of the world is not generally realized. Professor Bailey estimates that north of Mexico our continent contains 10,150 known species of plants, distributed in 1,555 genera and 168 families. This census makes record of 2,416 species, representing 769 genera and 133 families. Of these species 1,929 are now offered for sale in America; 1,500 have been introduced into England, 487 of which are not in cultivation in America. Nor does it follow that the species introduced into England are all now cultivated there; the record simply shows that they were once introduced there and when this occurred. Many of the southern species were procured by English collectors from the West Indies or from Mexico. Some of these may never have been seen outside of botanical gardens, and a few may have been lost to cultivation.

It is not strange, as Professor Bailey points out, that American plants should have been first cultivated in Europe, where the growing of plants for ornament had been developed into an art while the civilization of this country was yet in its pioneer stage, and, of course, unfavorable to gardening of this character. Besides, it seems to be the rule that horticulturists are attracted by the unfamiliar and strange appearance of exotics, and that novelty is quite as strong an influence as intrinsic merit in favoring the dissemination of plants. Drummond, Fraser, Douglas, and their contemporaries, as well as our own early botanists, with John Bartram at their head, were all assiduous in sending seeds and living plants to the gardens, and especially the botanic gardens, of Europe. It is worth noting that many of these early introductions have been so modified by long domestication that their appearance seems strange to

one who has only known them wild in their native home, and Mr. Dyer, the Director of Kew Gardens, asserts that even in the collection there the feral types are often wanting, and only cultivated forms are represented.

The list of fruits, vegetables and ornamental plants introduced into American trade during the year 1891 includes 884 species and varieties as against 575 for the year before, and 434 for the year 1889. This increase is due partly to the fact that increased experience and facilities enable the authors to make a more complete record. But the introduction of new Roses, Chrysanthemums, Carnations, Cannas and Geraniums, as well as of native plants, was unusually large last year, and shows a broadening and more active trade. Of the 884 introductions 668 are ornamental plants, 108 are fruit-plants and 108 vegetables. Of 188 native plants introduced twenty-four are fruit-plants, and twelve of the ornamental plants have edible fruits. Analyses like these are interesting, as they indicate in a striking way the tendencies, the varying vigor and the shifting fashions of our horticulture.

Other important titles in the Special Annals are the Plant Portraits of the Year, A Directory of the important Horticultural Societies in North America, A Directory of the persons in charge of horticultural work in the Experiment Stations, The Botanic Gardens of the World, Title-index to the horticultural literature of the Experiment Stations during the year, A Subject-index to the same, Horticultural Books of 1891, Tools and Conveniences of the year.

The first part of the volume, or the so-called General Annals, is a compendium of information on a great variety of subjects, which have been carefully selected and skillfully arranged. As an example of the quality of this portion of the *Annals* we quote the following passages on spraying machinery and fungicides:

"In spraying machinery there has been great activity in the manufacture of various styles of knapsack-pumps, and several horse-machines have been put upon the market or have received marked improvements. The most important departure of the year, however, is the labor of the committee appointed by the Association of Agricultural Colleges and Experiment Stations, to consider means by which uniform sizes of fittings can be secured for all spraying-machines. This committee, appointed in November, 1890, consist of W. B. Alwood, of Virginia; D. G. Fairchild, of Washington, D. C., and James Troop, of Indiana. It has secured the agreement of nearly all manufacturers to use standard sizes of threads and other fittings, and the advantages of its labors will be placed before the public for the season of 1892.

"In the treatment of plant diseases, two copper-sprays continue to gain favor, and their use for control of diseases of the Grape has already come to be an established practice among growers. It is a question of but two or three years before the leaf-blight of Quinces and Pears, Apple and Pear scab, and the old Potato-rot will come under the control of the general grower. There is a distinct movement in favor of the ammoniacal carbonate of copper as compared with the Bordeaux mixture, as it is cleaner, cheaper and much more easily used. Among new fungicides there are two which demand record here. The more important is that prepared by the Division of Vegetable Pathology of the National Department of Agriculture last year as 'Mixture No. 5.' It consists of equal parts of ammoniated sulphate of copper and carbonate of ammonia, thoroughly mixed, and put up in air-tight cans. A pound of this dry mixture is used to thirty to fifty gallons of water. The material is cheap, costing about forty-five cents per pound, is easily prepared, and can be kept in the dry state until desired for use. This material, which is essentially a dry eau celeste, has been used with good results upon those fungi for which the ammoniacal carbonate of copper and Bordeaux mixture are employed. Lodeman has found that the chloride of copper possesses merits which entitle it to trial for the common plant diseases. When used at the rate of three ounces in twenty-two gallons of water it gave better results upon Squash-mildew (*Oidium erysiphoides*, var. *Cucurbitarum*) than did the Bordeaux mixture."

The last serial issue of *Economic Fungi*, by A. B. Seymour & F. S. Earle, is a double one, including Fascicles iii. and iv., numbers 101-200. In it the authors have confined themselves to "fungous parasites on forest-trees and other woody plants indigenous or cultivated for ornament."

Not less than sixty-eight ligneous plants are enumerated in the list of host plants. Many of these have but a single fungous enemy given, while others bear four representatives, as, for example, the Honey Locust. Five species of Maples are represented, and among these the most conspicuous fungus

is the *Rhytisma* of the White Maple, which produces large irregular shining jet-black patches upon the leaves, familiar to many students of forest-trees. It is found upon the Red Maple also, where it disfigures and damages the foliage. Two anthracoses are shown, *Glœosporium decolorans* on Red Maple and *G. saccharinum* upon the Sugar Maple. This latter does great damage to the leaves, causing them to turn brown prematurely in large patches. There is a showy mildew of the Maple which forms a cobwebby covering to the leaves, and sometimes is particularly destructive to seedlings in the early autumn. A similar mildew of the same genus (*Uncinula*) is shown upon the Horse-chestnut, but the more common and vastly more destructive enemy to this handsome shade-tree is *Phyllosticta sphæropsoides*, which causes the foliage to turn of a reddish brown color early in the season. In August many trees are sadly blighted by this fungus and almost look as if they had been scorched by a fire.

Nine fungi are shown upon eight members of the Rose family. There is a conspicuous parasite upon the Shad-bush that covers the leaves with a dark, almost black coating. When a bush is affected in one part it usually is infested elsewhere, thus giving the plant a peculiar appearance. In *Podospheera Oxyacanthæ* we have a good illustration of a mildew that infests a large number of hosts in the same family, such as the Hawthorn, Choke-cherry, Meadow-sweet and Hardhack. When this appears upon a cultivated plant it may be remembered that it breeds abundantly upon wild plants just outside the garden fence. This is likewise true of the Peach curl (*Taphrina deformans*), which is shown upon leaves of the Chickasaw Plum and the wild Black Cherry. This last also harbors the serious leaf-blight of the cultivated Cherry that has defoliated the orchards in the west of late years.

The Elm family shows eleven fungi, and the Elms proper five. There is a mildew similar to the one upon the Maple, and identical with the one met with upon the various species of Ash and the Beech. It is interesting to note that forest-trees of widely separated orders become the adopted home of the same parasite. Usually a fungus does not go outside of one family, but in this case we have a striking exception. In the Walnut family there is one fungus that is given upon four hosts. This *Microstroma Juglandis* is one of the most showy of moulds, coating the affected parts of the foliage with a white layer. It is common to both *Hicoria* and *Juglans*, and is one of the many instances where the presence of a fungus indicates close relationship.

The largest number of fungi in the century is in the Oak family, no less than twenty-four being enumerated, and half of these are upon members of genus *Quercus*. Mildews are the prevailing form of parasites. There are no rusts represented nor smuts, while there is a goodly number of blights and a few anthracoses. One of the most showy and injurious species is *Marsonia ochroleuca* upon the Chestnut. Others are two leaf spots of the Hazel, and the Anthracnose (*Glœosporium Canadense*) of the White Oak. This latter has been the subject of frequent remark in all parts of the country, as it causes the premature dying of the Oak-leaves to a conspicuous degree.

Among the Poplars and Willows there are a number of injurious pests, one of which is a genuine rust—namely, *Melamporsora populina*. The most conspicuous fungus here is the black *Rhytisma* of the various species of Willows. One of the handsomest as well as most common of the mildews is upon the Willows.

Notes.

The horticultural and floricultural work in the French section of the Chicago Exhibition will be placed in charge of Monsieur Le Fevre, head-gardener of the city of Paris, who arranged and superintended the beautiful Trocadéro Gardens at the Paris Exposition of 1889.

Mr. James MacPherson writes to the *Country Gentleman*, that in the yard of the New Jersey State Insane Asylum at Trenton there is a specimen of English Yew (*Taxus baccata*) which originally came from Stoke Pogis church-yard, England, and it is now eighteen feet high, of a perfect shape, and has a spread of thirty feet.

Speaking of the timber of the Gum-tree, which in England is absurdly called Satin-wood, a Minneapolis writer says that in price it is about the same as that of Yellow Pine, and as a finishing lumber it has all the good qualities of that, with few of its imperfections. It will not sliver when used as flooring and as interior finish is susceptible of high polish.

A correspondent writes that the practice of removing tassels from Indian Corn, to which we alluded on page 384, is practiced largely in southern Europe, where only a few of the male flowers are left to fertilize the ear. The tops are used as green fodder for cattle, which is very scarce during the summer months.

Some months ago we published an appeal for the preservation of Poe's cottage, which stands in a much-neglected condition at Fordham. Now we learn that it is to be preserved, although not on its present site. It has been bought by a well-known Catholic publisher, and will be removed to his grounds, which, however, are in the near vicinity, and transformed into a library and studio for his use.

The recent blueberry season in Maine was a very good one, and surprising accounts have been given of the activity of the canning factories where this fruit is preserved. It was not uncommon, we are told, for 700 or 800 bushels of blueberries to be delivered at the door of a single factory during one morning, and as all had to be canned within the twenty-four hours, operatives were kept at work until one or two o'clock at night. Whole schooner-loads of the canned product were shipped to Boston and other seaports.

At a recent convention of the American Florists in Washington the question, What are the twelve best monthly or ever-blooming Roses for amateurs? was answered by Mr. P. O'Mara, of New York, and Mr. E. G. Hill, of Richmond, Indiana. Both lists contained the following Roses: Agrippina, Clothilde Soupert, Souvenir de Malmaison and Madame Hoste. To these Mr. Hill added Mrs. George Paul, Crown Princess Victoria, La France, Duchess of Albany, General D. Mertchansky, Sombreuil, Meteor and Grace Darling; while Mr. O'Mara named Hermosa, Perle des Jardins, The Bride, Sunset, Catharine Mermet, Mrs. DeGraw, Bon Silene and Madame Pierre Guillot.

A late number of the *Gardeners' Chronicle* gives the figure of a curious hybrid between a Black Currant and a Gooseberry, in which the hanging fruits resemble a currant, while the leaves resemble somewhat those of the Gooseberry. The fruit appears in bunches of from two to four. They are about the size of black currants, but in color like a red gooseberry, and are covered with fine hairs and destitute of seeds. The flavor partakes of that of a gooseberry and a black currant, and seems to Dr. Masters to be an improvement on both. If gooseberries of improved flavor can be grown in clusters and on a bush without spines, Mr. Culverwell, the producer of this new hybrid, will prove a benefactor to horticulture.

A correspondent of the *Journal of Horticulture* names the following as the best of thirty-six varieties of Sweet Peas raised by Mr. Henry Eckford, and displayed at a recent exhibition in Shrewsbury: Emily Eckford; this approaches a true blue, the wings of a well-marked cerulean tint, but the standard suffused with reddish mauve. Peach-blossom; the wings soft rose, shaded with cerise, the standard rosy red at the base, shading upward to pale pink. Ovid; one of the most richly colored varieties yet raised—a brilliant rosy carmine. Royal Robin; a clear pink, with blush wings and a white keel. Venus; a blush-colored flower, with a suffusion of pale yellow, very distinct. Stanley; a dark flower, with standard and wings brownish purple, almost black. Blushing Beauty; soft pink, suffused with lilac. Lady Penzance; large smooth flowers with a prevailing color of lustrous rose.

The following brief paper was read by Mr. T. T. Swinburne at the last session of the American Association for the Advancement of Science: "It is suggested that the American Association for the Advancement of Science, in the absence of a national flower, request the management of the Columbian Exposition to adopt the Columbine as the flower of the Fair, leaving the national flower, whatever it prove to be, to grow in popularity. Its name comes from the same root as Columbia, a name our country often bears; it is classed with the Aquilegia or eagle variety, because its petals end in spurs resembling the talons of an eagle; it grows in red, white and blue, our national colors; it has five trumpet-shaped petals, corresponding to the five points of the star upon our flag, and these are grouped around a central shaft, similar to the arrangement of the states around the central government; and it is indigenous to the North American continent, a hardy perennial and wild flower that is found in every part of our land, growing even upon the Rocky Mountains, and in the very heart of the country. It is appropriate in name, form and color. Its name suggests Columbia, and its form is the proto-

type of the Phrygian liberty cap, the head-dress of Columbia, and an exact copy of the cornucopia, the symbol of the Columbian Exposition."

"It is worth one's while" says a recent writer in a Boston journal, "to go to the Parker Memorial Building to see the labor of love which is being done by the young ladies who are interested in the Flower Mission. Inside there are groups of girls sorting the flowers, and around the door stand groups of children, some with baskets, some without, all lingering to obtain their much-prized posies. When the flowers have all been arranged, the work of distribution begins, and the young ladies start about on their errands which are to make so many people happy. At the hospitals, patients, nurses and surgeons are waiting for their visits, and the thankful looks and the grateful words repay them for all their trouble. To the crowded workshops some of the girls go and pass around among the workers, giving to each a bouquet. These are cherished, and when the day's work is done they are taken home to brighten up the ordinarily cheerless rooms in dark tenements. On a single day in July, and not an exceptional day either, 1,594 bunches of flowers were sent out to various institutions, besides some which were given away at the door of the Mission; and, in addition, fruits, jellies and vegetables were largely distributed. Nevertheless, the demand was always greater than the supply, and there is need for all livers in the country or owners of urban or suburban gardens to be constantly reminded of the existence of these missions, and of the infinite pleasure they give to the very poor."

The "Sacred Lotus," *Nelumbium speciosum*, has found a congenial home in one of the small lakes of Central Park, New York City. It has been established three years, and this season covers an expanse of considerably over half an acre, being, probably, the best example of the plant to be seen in the United States. The plants are thrifty, with leaves of the largest size, and at present hundreds of the noble flowers are open, while innumerable seed-pods show the wealth of bloom of the earlier season. Given a soil in which the tubers may mature properly each season, this *Nelumbium* will not only grow luxuriantly, but it can be counted on as perfectly hardy. In the large fountain-basin at the head of the Mall there are some exceptionally good specimens of *Nymphæa Zanzibarenensis*, both the blue and red varieties. The tubers are said to be three years old. The large highly-colored flowers and ample foliage attract more attention than any of the other varieties in the same basin. *N. Devoniensis*, *N. Sturtevantii* and *N. dentata* are represented, but these night-flowering varieties are not seen to the same advantage here as in such basins as Union Square, where there are electric lights. Masses of the Egyptian Papyrus with the *Nymphæas* make an effective picture in the upper basin, it not being at all crowded, and there being ample margins of water among the various plants. Abundant spaces of clear water around aquatic plants are the main essential to the perfect harmony and beauty of a water-garden. A tank or a lake covered entirely, even with the choicest plants, is, at its best, commonplace.

At the late Begonia Conference at Chiswick, England, the remarkable evolution of the present race of garden Begonias was illustrated by a collection from Kew, which showed the various stages of its progress from the original forms. In the *Gardeners' Chronicle* the singular fact is stated that several of the original species which formed the starting-points of this remarkable development have apparently disappeared from gardens, the parents having been completely superseded by their more attractive progeny. Historically, this is unfortunate, but the loss is not so great as it seems, for it must be remembered that these plants, unlike Orchids, have not been exterminated in their native haunts, and they can be reintroduced. Again, a much more complete record, both in the way of illustration and verbal description, has been made than was formerly done. It is not long ago since the source of novelties and the origin of crosses were often carefully concealed, and sometimes deliberately misrepresented, in the supposed interest of trade. We agree with Dr. Masters that it would be well if the hybridizers of these plants should in the future make an attempt to secure greater hardiness and greater variety, to form new and distinct races, and that they should give over attempts to produce flowers which are merely larger than they are now. If hybridizers and cross-breeders will follow the natural lines of the flower, will enhance and emphasize them rather than attempt to reduce them all to one uniform circular outline, they will not create flowers which, so far as their form is concerned, might be Hollyhocks or Double Balsams or Camellias or anything else than Begonias.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLES:—Legislations against Injurious Insects and Plant Diseases.....	457
Proper Park Facilities.....	458
Overland in the Cayuga Country.—III.....	Professor L. H. Bailey, 458
The Old Southern Country-seat.....	O. W. Blacknall, 459
"Shongum."—I.....	M. H. P., 459
NEW OR LITTLE-KNOWN PLANTS:—A New Hybrid Rose. (With figure.).....	460
Cypripedium Daisyæ. (With figure.).....	460
FOREIGN CORRESPONDENCE:—London Letter.....	W. Galdring, 461
CULTURAL DEPARTMENT:—Hardy Lilies.....	E. O. Orpet, 462
Autumn-blooming Perennial Plants.....	F. N. Gerard, 464
Cool-house Ferns.....	W. H. Taplin, 464
Tomato Diseases.....	Professor Byron D. Halsted, 465
Hardy Cyclamens.....	Edward Whittall, 465
CORRESPONDENCE:—Early Autumn near Cape Cod.....	Mrs. Schuyler Van Rensselaer, 465
Scab-proof Apples.....	Professor E. S. Goff, 467
RECENT PUBLICATIONS.....	467
NOTES.....	467
ILLUSTRATIONS:—A New Hybrid Rose, Fig. 78.....	461
Cypripedium Daisyæ, Fig. 79.....	463

Legislations against Injurious Insects and Plant Diseases.

THE amount of money which is lost every year in this country by the ravages of insects and of fungus plagues is so enormous that any attempt to state the figures in hundreds of millions of dollars would sound like an exaggeration. We are constantly reminded, however, of these losses, and within a week past two of the bulletins received from state experiment stations contain statements which will help us in forming some estimate of their extent. The September bulletin from Michigan asserts that the loss in that state this year to the Oat crop alone by the single disease known as smut exceeds \$1,000,000. Professor J. B. Smith, the Entomologist of the New Jersey Experiment Station, in the report for the year, just received, asserts that insects exact a tax of fully ten per cent. on the farm products of that state, and this tax is all taken directly from profits. Dr. Shimer, whose estimate has been approved by the highest authorities, has stated that in one year the corn and grain crop of the single state of Illinois suffered to the extent of \$73,000,000 from the chinch-bug, and Professor Comstock estimated that the ravages of the cotton-worm in years when it was generally prevalent caused the loss of \$30,000,000. If the agricultural products of the United States approach \$4,000,000,000 annually, and one-tenth of this is destroyed by insects, the addition of the loss caused by fungus diseases would easily swell the figures to a total destruction of five hundred millions per annum. Whether half a billion dollars, or, say, a million and a half of money every day, is over the truth or under it as an estimate of this loss, the fact remains that the amount of the destruction is quite beyond the grasp of the ordinary imagination.

The increased knowledge of the history and habits of destructive insects and of fungi which cause plant diseases is the most striking feature in the progress which has been

made in agriculture and horticulture during the last twenty years. We can all remember when these losses were endured as a matter of course, and with scarcely an effort to avert them, while now there is an organized corps of skilled investigators in every state who are studying and experimenting to discover the best practical means of defeating these enemies, and some knowledge of the latest and most approved fungicides and insecticides, and some familiarity with the best machinery for applying them, is a necessary equipment for the ordinary farmer and gardener. But these enemies come in such countless multitudes, and their operations spread over so large a territory, that no effective stand against them can be made without concert of action. It is useless for one man to rid his Plum-trees of the black knot or his Apple-orchards of the tent-caterpillar if his neighbor allows both the insect and the fungus to breed on trees in an adjacent lot. It seems reasonable, therefore, that some legal means should be devised of compelling land-holders to keep their premises free from certain kinds of insect and fungus pests.

The state of Michigan was visited with some severe criticism a few years ago for enacting a law to suppress the peach yellows, and an attempt was made to overthrow a similar law in New York state by persons who contended that the yellows was not a specific disease which was communicable. Time, however, has vindicated the wisdom of this law, and now not only has Michigan a new and more effective law, but Delaware, New York and California have passed enactments which look in the same direction. In New Jersey the experiment station authorities have the power to destroy crops which are infested with new and dangerous fungi—a law which was passed as a result of the investigation of the cranberry-gall fungus two years ago. In California and Washington there is an inspector of fruit pests, who has power to quarantine fruit packages, trees, plants, cuttings and cions which are believed to be infested with insects or disease germs liable to spread contagion, and this quarantine is good not only against foreign countries, but against the other states of the Union. This is the first organized effort to exclude contagious plant diseases from a given territory, and if it is honestly executed it will be watched with great interest. It is worth noting here that many nurserymen in the east argue that the prime purpose of this law is to prevent competition in the nursery business. Beyond these laws there have been sporadic efforts to exterminate some particular pest, like the attack in Massachusetts upon the Gypsy-moth, or the efforts of the General Government to afford some protection against the grasshoppers in the west. But, after all, it is plain that, as compared with the magnitude of the evils, the efforts made by state governments for the protection of the property of their citizens have been slight and desultory.

In a few of the states, laws to prevent the spread of noxious weeds are in force, and, of course, laws against insects are based on the same principle. And why should not the protection of plant life be as justifiable a subject for legislation as the protection of animal life? The state will spend hundreds of thousands of dollars to stamp out pleuro-pneumonia from its herds, and yet the pecuniary loss and the discomfort to society from this disease are no greater than what happens from the destruction of the vineyards by the phylloxera or black rot. To be effective, however, legislation must be based on the best available information, and it should be general. It is not to be assumed that the members of our state legislatures are sufficiently well acquainted with the habits of insects or the life-history of fungi to devise the best means of attacking them. But there are in almost every state persons who are skilled in economic entomology and in mycology, and their knowledge and experience are available. There is an association of economic entomologists who represent every part of the United States. There is an association of officers of the experiment stations and the agricultural colleges, whose business it is to look after the interests of agriculture and of horticulture. This certainly is a subject to be

taken up by some body of national importance so that a code of laws, which are general in their character and which would be applicable to the needs of all the states, could be devised. Bills should be drawn which would be comprehensive enough to include the most dangerous contagious diseases of plants and the most destructive of insects, and they should be framed to fit the special needs of different states. There is little doubt that such bills could be pushed through to enactment if the association of station officers and, through their influence, the various state boards of agriculture would urge their importance upon our law-makers. Only by some strong movement of this sort can we hope for a code of laws under which a hopeful contest can be waged against the enemies of our crops. The enforcement of this legislation might cost considerable to begin with, but the expense incurred would be small compared with the enormous drain upon our resources from the unchecked, or only partially restrained, ravages of these pests.

An American gentleman, writing from England, notes two things in particular which help the people there to get more for their money in the way of recreation than we do here. One of these is the enormous amount of common land so easily accessible from the great cities, and the other the fine roads for bicycling, a form of recreation in universal vogue. In his native city, Cincinnati, this gentleman remembers that it was almost impossible for the boys to have a game of base-ball, and the few places then available are now covered with buildings. He says: "None of Cincinnati public parks are ever used for games, and I don't think many of our western cities allow such use of their parks. Here nearly all the parks have immense spaces reserved for cricket, tennis and the like, and the London vestries are continually acquiring new land for recreation purposes."

While Cincinnati is exceptionally backward among large western cities in providing proper park facilities, the charge of not permitting a sufficient use of the parks for games would certainly not hold against Chicago, where the people enjoy the parks to a remarkable extent. Here in New York and Brooklyn, as well as in Boston and other Atlantic cities, ample facilities for popular recreation are provided in the parks. In Boston the open-air gymnasiums for men and women on the Charles-bank are such gratifying successes that a number of others are to be established in various sections of the city. The Earl of Meath reported to the London park authorities most enthusiastically on these institutions, and, in consequence, the example of Boston has been followed by the establishment of fourteen gymnasiums on a similar plan in the British metropolis.

Although England is very fortunately possessed of ample open-air spaces near her great centres of population and makes appreciative use of them, neither in beauty of landscape design, tastefulness of maintenance, or adaptability to their purpose do the English public parks, as a rule, approach the great parks of our own cities. But there is great room for the growth of an intelligent sentiment in favor of public parks in this country. Many of our great cities are alive to the advantages of spacious park-areas; but even here, the oldest, the most famous and the most useful, because the most beautiful, parks are in constant danger of confiscation or perversion to some special purpose, which would destroy their highest value as recreation-grounds for the entire population. On the other hand, the rapidly growing cities of moderate size, which in a decade or two more will rank as large centres, have not been alert to make provision for the future by taking for park purposes attractive suburban sites. Such sites may now be obtained for a trifle in comparison with what they will cost when the absolute necessity actually arises. And then it will too often happen, when the need does become urgent, that the favorable sites are built over or in some way ruined for park purposes.

Overland in the Cayuga Country.—III.

FROM Farmer Village an old "angling" road runs over the country to Ovid, a quiet village midway between the two lakes, Cayuga and Seneca, and which commands a view of both. This was in early times a famous Wheat country, and much of the staple is still grown, with as great yields as ever. But the old line of farming is not paying well, and the younger men are branching out into specialties. In Ovid is perhaps the most typical example which I have found of the success resulting from persistent and thoughtful effort in a minor branch of agriculture, all the more remarkable from the fact that the man has labored without instruction in a comparatively isolated inland town. This man is a berry-grower. Seven years ago Mr. Banker had one and a half acres of land, a very poor house and few of the conveniences of living, and was \$200 in debt. He now owns sixteen and a half acres, is laying up money, has built a new house and furnished it well throughout, and his children are going away to school. This he has made legitimately from the land, with no capital and no help. The neighboring farmers offer to sell him land, but he wisely concludes that sixteen and a half acres is enough, and will not buy more. I have never met a happier and more contented farmer. "I have just enough land to keep me busy, and not enough to work me to death," he remarked, "and I make a good living and have all the fun I want. No other business has any temptation for me." The largest part of Mr. Banker's business, probably, is in raspberries. These he sells both fresh and dried. He has a home-made evaporator, in which he manufactures about a ton of dried product annually. Among black raspberries he finds Gregg best for selling upon the daily market, and Ohio best for drying. Among the red Raspberries he still grows the Red Antwerp; with Early Richmond for the first markets. Mr. Banker makes a strong point of close-planting of the Raspberry, and rightly, too, I think. His rows for all varieties are seven feet apart, but the plants stand only two feet apart in the row. This thick setting brings earlier berries and gives more bearing surface per acre, and as he thins the growing canes severely and gives excellent cultivation, the plan succeeds admirably. But his strongest point in favor of this close planting is the smothering of grass and weeds, and the consequent great saving in hand-labor. He seldom hoes his plantations after the first year, and they remain clean. He declares that if he had learned this simple thing early in his experience, he would have been much better off to-day. It is needless to add that Mr. Banker believes in thorough work. In 1890 he bought five acres of waste bush-land near the village at a cost of \$300. This was tile-drained and thoroughly improved, and was set to black Raspberries in the spring of 1891. The improvements and plants cost \$200. This year he sold plants to the amount of \$175, and he estimated that the crop upon the vines would easily clear off the remainder of the \$500. Judging from the remarkable crop the bushes were carrying, I am convinced that he is right.

It is not far from Ovid to Romulus, and at this hamlet we came upon the Niagara Grape at its best. It is impossible to estimate the number of acres planted in this Grape from East Varick on Cayuga Lake to Kendaia near Seneca Lake. Mr. O. F. Reed, at Romulus, has the management of 590 acres of Niagara vineyards. This immense area is divided into three portions, each owned by a different company, but belonging to practically the same parties. The King Niagara Vineyard Company owns 150 acres, the Cayuga Lake Vineyard Company, 205 acres, and the Seneca Lake Vineyard Company, 235 acres, and these represent three solid blocks of the areas mentioned. These vineyards are all young, the oldest having been set but four or five years. The labor problem, therefore, has not yet presented itself in its full force, although Mr. Reed is now considering plans for securing sufficient pickers when needed. A crop of 70 tons is expected from one vineyard this year, and 140 tons from another. When the vineyards are eight years old the crop is expected to be from 2,500 to 3,000 tons annually. "No, we shall not try to sell it all as green fruit," he replied, in answer to a question. "We may make some wine, but we are looking more especially to unfermented grape-juice as an outlet for our crops." He then explained the process of making this article, as follows: Grind the grapes coarsely, taking care not to crush the seeds. This should be done in the afternoon. Place the material in tubs. The next morning, filter through paper, and heat nearly to the boiling-point and remove scum. Filter again, heat to nearly boiling-point and bottle. All those great vineyards, like that of Moore's Diamond, at Farmer Village, are trained upon the Kniffen system, and the tying is done almost entirely by

women. For this training two wires are used, and in these vineyards the lower wire is three feet from the ground and the upper one five and a half feet.

About fifteen miles from Geneva the horticultural region was left behind, and we came at once into general farming on the high land well up between the lakes. The whole country is admirably adapted to fruit of various kinds, and the time cannot be far away when the farmers will believe that fruit-growing is more profitable in this region than hay and grain. The country becomes much lower northward, and rolls away on all sides in mighty billows, until lost in the blue hills beyond the lakes. Near Geneva, beyond the foot of Seneca Lake, is the farm where John Johnston did the first tile-draining done in America. The old house still stands as he left it, with low ceilings, quaint "cubby-holes" and curious old latches. The farm is now owned and managed by Mr. Charles R. Melten, a young man of spirit and intelligence, who makes the most of his opportunities. "The old farm still outdoes any of its neighbors in productiveness," he remarked, "and I attribute the fact to the good old tile-drains and to the careful management which the land received in its early days. That field over yonder we always expect shall give us forty bushels of wheat to the acre, and last year it gave us an average of forty-two bushels and a peck." Adjoining the old Johnston farm is Rose Hill, the finest farm homestead between New York and Chicago; this is the estimate of a committee of appraisers to award damages entailed by a new railroad which cuts off one corner of it. Originally it contained over 1,100 acres; it was settled early in the century by a Virginian by the name of Rose. The present house and appurtenances are palatial, and of a type very rarely seen in American country-seats.

Cornell University.

L. H. Bailey.

The Old Southern Country-seat.

THE house in which a man lives goes far toward disclosing not only his tastes and intellectual development, but also his habits and modes of living. It has always seemed to me that the old southern homestead of the better class was peculiarly characteristic of our people in the halcyon days before the war. A thousand things told of boundless and tireless hospitality. The sagging "big gate" on the public road, one of whose posts, at least, was often a living tree, while extremely hard to shut, would open almost of its own accord. Besides, it had a great habit of hanging wide open as if inviting every passer-by to enter and make himself at home. And the chances were that the yard gate had the same habit. Inside, the shaded walk was broad and ample, as if many visitors were expected to walk abreast between the files of stately Box-trees up to the mansion, whose porch and hall and rooms and all their belongings were of the same generous dimensions. The kitchen fireplace was huge enough to cook for an army. An abundance of roomy arm-chairs, made of native wood and bottomed with native bark, offered comfortable nesting-places, so comfortable that it seems as if chair-making is now one of the lost arts.

The architecture of the building depended, of course, on the era of its erection. If early in the century, sharp roofs and dormer-windows were apt to prevail. Later, just previous to the war, hip-roofs abounded. Whatever the style, the rooms were almost sure to be large and square, and there were plenty of them. Eighteen feet square was a favorite size, though many were larger and few smaller. The house was invariably white, with green blinds; with their accessories of green trees and dense shade, these colors were beautiful and appropriate beyond all others. Red kitchens, smoke-houses, carriage-houses and other outbuildings lent picturesque to the scene. The palings, generally of large ornamented posts and small pickets, were also invariably white. Hedges in the way of enclosures were practically unknown, while ornamental hedges of Box were common. Cedar was also used for this purpose, though to a much less extent on account of the great care necessary to keep it trim. Flowers were nearly all grown in the vegetable-gardens some distance to the rear of the house, but there were always some Roses along the front walk, and often a bush of running Roses trained on one side of the porch. But little attention was paid to pot-plants, the Geranium taking precedence among the few flowers grown. In most yards no sowing of grass-seed was necessary, the native grasses, if protected from weeds, giving usually an excellent sward. Protected by the fallen tree-leaves purposely left in autumn, it remained green from the uncovering in early March till the trees again cast down its winter robe of russet-brown. Few Oak-trees were located in the yard, or at least to the front of the house, on account of

their injury to the grass, while under most of the other trees planted for shade or ornament it grew even more luxuriantly than in the open.

Riding was almost universally practiced by both sexes, and the horse-block from which the ladies of the family reached their saddles was a fixture in every homestead. Sometimes this "block" was a granite cube rudely dressed by the farm mason, or may be a lichened boulder which nature had placed just in the right spot or very near it. Almost every place had its pigeon-cote; some of these were elaborate and ornamental, housing many hundred birds. The squabs were occasionally killed, but generally the pigeons were allowed to multiply undisturbed, much to the annoyance of the overseer, who was constantly complaining of their attacks on newly planted corn and peas. Few places had wells, or, having them, used their waters. Everybody preferred spring-water, which was considered better and more wholesome. Among the hill-districts these springs were often wonderfully bold and beautiful, their sparkling waters pausing a moment in the natural basin of solid rock, and then dashing off between mossy roots and lichened stones down a glen all greenness and shade. That these springs were all the way from a hundred yards to half a mile from the house made little difference as things then were. There was always a swarm of nimble-footed pickaninnies ready for this or any other errand. Indeed, some such light service was necessary to keep them out of mischief, and to drive cows, mind gaps, blow fires akindle, and keep chickens out of the garden left enough idlers to give a world of trouble about the kitchen and back-yard. "I use daily a five-hundred-dollar candle-stand, a four-hundred-dollar washstand, and a towel-rack nearly as valuable," was the mild and oft-repeated joke of an old gentleman who was served by a swarm of these sable urchins.

But all these things belong to a past whose remoteness cannot be measured by years, because they are a part of a different era, a different order. The chances are that the old homestead has long since gone to decay. All but a pitiful corner of the spacious garden has been turned into a corn-field; browsing stock have played havoc with the grass and shrubbery of the yard; the shorter-lived shade-trees have long ago died, and others have grown scraggy or unkempt; the long, well-kept rows of negro quarters have succumbed to time, and the laborers are scattered in fragile huts so as to be convenient to the fields they tend.

The "Great House" itself has shared in these changes. Thirty years of wind and weather have toned down its once cheerful white and green into melancholy dinginess. The roof, despite its shroud of moss and lichens, is so frayed and unsound that one wonders how it contrives to keep out the rain. The former occupants and their fortunes have undergone no less a change, and, if they remain under the old roof-tree, maintain scarcely a shadow of their former state and hospitality.

There is, of course, no lack of snug and thriving homes all through the south, but few of these grand old places, too cumbersome for modern needs, remain, and the old-time southern country-seat is fast becoming a memory.

Kittrell, N. C.

O. W. Blacknall.

"Shongum."—I.

THE Shawangunk Range is a minor branch of the great Appalachian chain. Its most northern point, near Kingston, Ulster County, New York, divides the valley of the Wallkill from the great Rondout valley, and thence, extending south-west, attains in some places a height of 1,800 to 2,000 feet. The Erie Railroad crosses it at Port Jervis, and afterward it is lost in the Alleghanies. Its elevation is so inconsiderable in comparison with the lordly Catskills, which look down upon it across the wide and fertile farm-lands of the valleys, that it was left unnoticed and unknown for many years after the higher mountains had been well explored by summer tourists. But, aside from the historical interest connecting it with the early history of the Dutch settlements along the Hudson, this region is worth consideration for its own sake. Its easy accessibility by rail and river makes the little world thus elevated above the sea-level a ready refuge from the summer heat, and its system of lakes and streams and cascades and forests affords picturesque delights to the artist and unending studies to the botanist.

When the mighty forces of primeval nature uplifted these masses of white sandstone and quartz conglomerate it was done with so steady a hand that the level strata were hardly anywhere tilted; and they stood in parallel lines with gaps between, one mountain wall pushed a little past the next and commanding it—in military phrase—en échelon. Then came the long win-

ter, when the glaciers plowed deep valleys, and on either side piled its broken buttresses and angles against it in the passage, filling its gaps, leveling the tops of its cliffs, smoothing and shaping the spaces inside its outer walls, scooping the abrupt valleys and wearing deep holes in the conglomerate, where now repose the tiny lakes that feed its romantic streams. But its highest points were left unmoved, in level firmness, square and compact as if these were immense forts built for the wars of Titans. And since then, though the storm king at times holds high carnival here, the wear and tear of the elements have been propitious rather than otherwise. The disintegration of the conglomerate gives elements of fertility, and also, when under water, hardens to an imperishable cement, while the sandstone is harder than granite and far more enduring.

Its location gives a wide outlook, for the range is comparatively narrow and isolated, and there are points from whence the view is bounded to the south and east only by the Highlands of North River, the bay at Newburgh being visible, with Storm King frowning above it; or one looks north-east to see the Berkshire Hills of Massachusetts, and north over the levels to where the Green Mountains of Vermont lie in a blue undulating line beneath the farthest clouds. To the west rises the abrupt ascent of the Catskills from the plain, far enough distant for the most exquisite atmospheric effects, and the graceful sweep of these curves toward the south-west opens ever-changing glories of light and color, as the sunshine bathes them or the showers sweep over them.

Our first personal knowledge of the Shawangunk Mountains (commonly called "Shongum") was on a still afternoon, after a morning that had been full of enchanting surprises of light and shadow among the picturesque highlands of the Hudson. A little jaded with travel we had looked over the shoulders of our stage-driver, and without much interest, at the distant uplands, which we were told contained our point of destination, but with which the present direction of our big slow-moving horses seemed to have little to do.

For an hour our road lay through undulating farm-lands in the rich Walkkill valley, and then suddenly turning to the north we drove down a long hill into a deep dell, and straight at the heart of the mountain whose thousand feet of stone seemed to rise like a wall before us, stretching away in unbroken line for miles on either hand. From the depth of the dell where we had entered a grove of Chestnuts, for some distance up this height, the debris piled against it in huge rocks and broken soil, is covered with a forest-growth, hundreds of feet above the trees.

Certainly it required faith in modern engineering to believe anything but eagles' wings would raise us to the top of this perpendicular; but after going down till it reached the lowest point at the foot of this majestic pile, our road began timidly to take hold of its skirts, and climb the way along its side, giving us views of great beauty over the wide valley we had left. Then we reached a break in the wall, and turned sharply away into a pass that was once an Indian trail, and affords the only natural access to the interior of this range for many miles. Here in a few moments a heavy rain struck us, and our horses labored up the steep ascents, straining their great flanks and standing with their legs gathered under them while they took breath a moment on the shelves cut in the road for that purpose, or dragged the coach with the wheels all locked down the steep descents that seemed aimed at the centre of the earth.

When the shower had passed we found ourselves in a fertile region abounding in a great variety of wild growth. One could think that Flora, hiding in these fastnesses, had amused herself in sowing all manner of seeds to make a garden of the wilderness. The Chestnut crowded the Oak, and the red-tipped leaves of the Sassafras peeped between. The Sumach made a lusty growth, and held its green heads high in rocky spaces, vaunting a promise of future brilliancy. Above all towered the Pines, which form the chief glory of the upper plateau to which we had at length ascended. The great rocks amid which our road curved were covered with brown lichens of curious form, while every hollow, every broken place and coign of vantage had its tuft of Fern or its bed of mosses. In the open places bordering the roadway we saw the deep green stiff leaves of the Laurel (*Kalmia latifolia*) bristling against baby Oaks and Chestnuts, whose faces, wet by the late shower, were lifted to us in a kiss of welcome; or the sun glinted from the waxen foliage of the Rhododendron, both *R. maximum* and *R. Catawbiense* growing freely here, and just out of blossom. The fragrant breath of the Spice-bush came to us from some hidden nook, and the beautiful Clematis vitalba threw out its pearls of buds or its feathery blossoms to glorify the rough Raspberry and Barberry bushes lining our way. In other

places there were plantations of Golden-rod contrasting with the brown blooms of the Bindweed (*Calystegia Sepium*) made a thicket of the broken banks whereon were grown in profusion the Blueberry-bushes dear to us from the days of our childhood; for blueberries are everywhere here called huckleberries by the unhappy mortals who have never known the difference between the blueberries of Maine and the sandy abominations sold under their name in the New York markets. But these are the real blueberries, pulpy and juicy and sweet, with the cool, pearly, delicate bloom on the fruit as if frost-fingers had touched them to mark their northern origin. While beneath the trees everywhere grow all varieties of the Pyrola, whose white blossoms now give promise that in autumn their scarlet berries shall chord with October glories, as these berries reflect the blue and gray of summer skies.

Minnewaska, N. Y.

M. H. P.

New or Little-known Plants.

A New Hybrid Rose.

WE have on many occasions alluded to some hybrid Roses which Mr. Jackson Dawson, of the Arnold Arboretum, had produced by using pollen of various hardy sorts upon the Japanese *Rosa multiflora*, which is one of the most beautiful of hardy flowering shrubs. One of these hybrids, in which General Jacqueminot was the male parent, was the subject of an illustration in GARDEN AND FOREST last year (vol. iv., p. 533). It is a vigorous climber, with clusters of semi-double rose-colored and exceedingly fragrant flowers. We reproduce in this number (see p. 461) a photograph of another of these hybrids, in which the single flowers are pure white, with yellow stamens, and borne in clusters after the manner of the seed parent. They are three times as large as the flowers of *Rosa multiflora*, and are fragrant. In this case the pollen parent is the Hybrid Perpetual, Miss Hassard, and the plant has the thorns and foliage of this variety and the half-climbing habit of the Japanese species. Miss Hassard is a Rose which was raised from Marguerite de St. Amande, which is a free grower, with sweet-scented flowers. Marguerite de St. Amande is a seedling of Jules Margottin, and this was probably raised from the old and very hardy La Reine, a Rose introduced fifty years ago, and still well known. Roses of the La Reine type endure more cold than any other class except the descendants of Baronne Prévost, and they include such admirable kinds as Anna de Diesbach, François Michelon and Paul Neyron. The new hybrid, therefore, comes of free-growing and hardy parentage, and, if pedigree counts for anything, it ought to prove one of our sturdiest plants. *Rosa multiflora*, although it has been known for a hundred years, has only in very recent times been introduced to gardens, although its double form crossed with *Rosa Indica* and others has been the origin of the Miniature Cluster or Polyantha Roses which have long been popular. They are not reliably hardy in this country, however, and we have no doubt that the new strain of Roses which is being raised by mingling the blood of *Rosa multiflora* with perfectly hardy sorts will produce many plants which will prove satisfactory and useful.

Cypripedium Daisyæ.

THE flower of the *Cypripedium* reproduced from a photograph on page 463 is from the collection of Mr. H. Graves, of Orange, New Jersey, after whose daughter the plant has been named. It is a hybrid between *C. Lowii* and *C. cænanthum superbum*. The leaves are eight inches long and one and a half broad, bright green and faintly tessellated. The flower-scape is sixteen or more inches long, brown, pubescent, one to three flowered. The sepals are white, pale green through the centre, veined and tinted with carmine, with a few dots of brown at the base, the dorsal one being slightly deepest in color. The petals are long, narrow at base, the inner half a primrose-yellow variegated with purple, the outer half carmine. The lip is similar in shape to that of *C.*

Lowii, being brown, shaded vinous red, paler veined green beneath. The infolded lobes are speckled crimson, and the obcordate staminode is carmine and pale green.

Foreign Correspondence.

London Letter.

OUR garden and flower shows were never brighter in September, though the first frost may deprive us of the Dahlias and of the Begonias, which are being quite gen-

terest was centred in the new hybrid Orchids, exhibited for the first time. Messrs. Veitch, of Chelsea, took a first-class certificate for a beautiful little hybrid, a cross between the scarlet *Sophronitis grandiflora* and *Lælia elegans*, this being the pollen parent. It is named *Sophr-Cattleya Veitchii*, and in growth is intermediate between the parents, but with larger flowers than *Sophr-Cattleya Batemanniana*, being three inches across. The color of the sepals and petals is a bright cinnabar-red, flushed with rose, and of the pointed lip, a rich crimson, with bright yellow interior. It is a plant sure to be valued by orchidists. The other



Fig. 78.—A New Hybrid Rose.—See page 460.

erally relied upon for autumn color after the Pelargoniums have grown rank and flowerless. The exhibition of the Royal Horticultural Society at Westminster on Tuesday was of unusual interest. Besides an extensive collection of brilliant exhibits there were a large number of novelties, especially in florists' flowers and Orchids. The chief in-

hybrids were *Cypripedium* H. Ballantine, between the elegant *C. Fairieanum* and *C. purpuratum*, partaking of the character of both, and as rich in color as *C. purpuratum*. *Lælio-Cattleya Proserpine* is a cross between *C. velutina* and *L. pumila* Dayana, and, though interesting, is not so beautiful as many other hybrid *Cattleyas*. Messrs. Sander,

of St. Albans, sent some extremely choice exhibits; the cream of which was a new *Cattleya*, supposed to be a natural hybrid, but which looks like a variation from *C. aurea*. The flowers are of the same shape, though larger than *C. aurea*, with a broad, spreading, shallow labellum of a splendid amethyst-purple netted with gold, and broad sepals and petals of a delicate blush-white. It is one of the most beautiful *Cattleyas* I have yet seen. It is named *C. Oweniana*. It won a first-class certificate, as did also another *Cattleya*, from Mr. Lee, a Manchester amateur. This was a snow-white variety of *C. speciosissima*, and was named *Sanderiana*. The flower is very large, of faultless shape, and a pure white throughout with the exception of a blotch of lemon-yellow in the throat. In striking contrast was a group of the vivid scarlet *Habenaria militaris*, from Sir Trevor Lawrence. This is a small-growing terrestrial Orchid with long spotted leaves and erect spikes of flowers with trifid labella. No other Orchid that I know, except a *grandiflora*, has such a glowing color as this.

Messrs. Linden showed the new *Arides Augustianum*, with long and dense spikes of small flowers of a pale rose-pink color. This was considered worthy of an award of merit. From Brussels also came some distinct and fine varieties of *Cattleya Acklandiæ*; *maxima*, with a very broad lip, and *guttata*, with heavily spotted sepals, being the finest. Baron Schröder sent a fine erect spike of the new hybrid *Phajus maculato-grandifolius*, raised by Messrs. Veitch. It is among the finest of yellow Orchids, the color of the large flowers being a bright canary-yellow, with lips of chestnut-brown. A large group of *Dendrobium Phalænopsis*, some having spikes carrying two dozen flowers, showed how finely this splendid Orchid can be grown by amateurs who understand the peculiar treatment it likes. *Vanda Sanderiana*, the unique *V. cœrulea*, helped to swell the Orchid display, as did also a pretty group of *V. Kimballiana* from Messrs. Low. This has become an established favorite among orchidists here, as it has no doubt in America. A large number of hybrid *Cypripediums* were shown, but these are becoming so numerous and so much like each other that it is impossible to describe their peculiar characteristics. Some hybrid *Cypripedia* are distinct and handsome, but in many instances these hybrids are much less beautiful than their parents.

Some deliberation was required by the Floral Committee in certificating varieties of *Gladioli* and *Dahlias*, the novelties being so nearly like the older sorts. Among hundreds of spikes of Messrs. Kelway's *Gladioli*, which made a splendid array, only two were found worthy of a special certificate. These were *Numa*, a massive spike of white flaked with rose and tinged with yellow, and *Poetis*, blush-white, flaked with rose and yellow. Messrs. Kelway seem to have reached the climax with the *Gandavensis Gladioli*, but it is said that there will soon be some startling novelties from intercrossing their strain with Lemoine's hardier race, which has, moreover, a greater range and stronger contrasts of rich colors, which have gained for them the popular name of *Butterfly Gladioli*. Among the new *Dahlias* the most remarkable were those from the famous growers at Salisbury, the Messrs. Keynes. These were all of the true Cactus-flowered class, like the original *Cactus Dahlia Juarezi*, not the spurious *Cactus Dahlias* that have been sent out of late years. Of the several shown four were selected for certificates: *Mrs. Bashan*, pink, flushed with yellow; *Kaiserin*, pure chrome-yellow; *Countess of Radnor*, pink, tinged with warm yellow, and *Bertha Mawley*, bright scarlet. These are all first-rate in every respect.

Of the new Burmese Lily (formerly called *Lilium Wallichianum superbum*, now named *L. sulphureum* by Mr. Barker) Messrs. Low had a magnificent group, which showed what a noble Lily this is for decorative effect. The plants ranged from three to five feet high, and each bore from three to five enormous trumpet-shaped flowers of a rich yellow and white. It is not only a fine greenhouse Lily, but proves suitable for outdoor culture in summer. Messrs. Pitcher & Manda sent a fine lot of Lilies, and

remarkable types of the red-striped *L. auratum* (*Rubro vitatum*), which has this year been admirable in the open air at Kew. It is a Lily that attracts everybody, and the finest forms of it are scarcely inferior to the famous *L. Parkmanni*, a glimpse of which we have in flower yearly from Mr. Waterer, at Knap Hill, where it is propagating itself slowly.

That very fine *Canna*, the *Star of '91*, won a first-class certificate, though it was an argued point among the committee as to whether it was as fine as *Madame Crozy*, but as it was considered by the majority to be quite distinct in color it was voted the award. There was a hybrid *Passiflora* between *P. racemosa* and *P. quadrangularis*, which, though interesting, has not much floral merit. A pretty plant was a new seedling *Tacsonia* named *Smythiana*, with scarlet flowers, which we may hear more of later on. Messrs. Veitch had specimens of the hardy *Clerodendron trichotomum*, which, however, did not seem to attract the committee, though it was admitted that every hardy shrub flowering in September was a welcome addition. They also had a fine basket of *Bignonia grandiflora* from the open air, which indicates the favorable warm summer we have had.

Kew.

W. Goldring.

Cultural Department.

Hardy Lilies.

THE list of Lilies that may be called perfectly hardy is a fairly large one, even after eliminating those that may possibly flower once and then disappear. Among these latter class are many very beautiful varieties, including several north-western American species, such as *Lilium parvum*, *L. rubescens* and *L. maritimum*, three species with small bulbs and of dwarf habit which dwindle away under cultivation, even though most tenderly cared for. *L. Columbianum*, *L. Humboldtii* and *L. Washingtonianum* are tall-growing kinds in their native Sierras, and the two last-named produce immense bulbs which often lie dormant a whole year only to put forth a feeble stem that rarely flowers here in the eastern states. Deep planting has been recommended for these Californian Lilies, but it does not make them thrive; indeed, it is necessary to plant them at least twelve inches deep to prevent their premature appearance above the ground where they are cut off by late frosts in spring. Evidently there are some necessary conditions which we do not comprehend or cannot give, to make such lovely plants at home here. For the amateur, therefore, it is safe advice to plant very few of the six kinds named above. Of other Lilies that I have hitherto failed to keep, *L. tenuifolium*, a Siberian species, flowers once and then dies, though it is the easiest of all Lilies to raise from seed, but *L. pomponium* is so much superior to it in every way that it need not be further considered. *L. Pyrenaicum*, which should be perfectly hardy here, has always failed with me, the bulbs decaying at their base and eventually disappearing, but at its best *L. Pyrenaicum* would be an undesirable kind to many on account of its heavy odor. *L. Martagon*, the typical *Turks-cap Lily*, with its white variety and the so-called black variety, *Dalmaticum*, are sometimes grown successfully in the United States, though I have never managed to keep them. It is said that they prefer a poor, stony soil. If they could be grown, the three kinds of *L. Martagon* would form an interesting group, and they flower early in the year. It is dismal work to have to record so many impossibilities, but it must be remembered that I am simply recording my own experience. Other persons may succeed with them, but it would be safe advice to novices to make trials of other kinds in preference at the outset. It is with a sigh that I include *L. Szovitsianum* with the foregoing, for, to my mind, it is the most beautiful of all Lilies, though not the most gorgeous, but the beautiful canary-yellow flowers with their deep red base never greeted my eyes but once. Their beauty is not forgotten, nor can I forget that out of a dozen bulbs but one flowered, and that was the first year after planting. The next year no bulbs were there to flower.

And now, as we consider the kinds that may be planted with hope, it must be remembered at the beginning that it is difficult to state just when they flower, because, in every locality the time would vary. *L. Hansoni* with me has always flowered first, and it is a beautiful Lily; the petals are thick, almost leather-like in texture, bright orange-yellow, with red spots; the plant is vigorous and free-blooming. *L. pomponium*, as stated before, should be in every garden, instead of *L. tenui-*

folium, because its flowers are of the same bright orange-red, and there are many on a stem varying in number with vigor of the plant. The flowers appear early, too, and are pleasantly fragrant. *L. croceum* is the old-fashioned orange Lily, and is a good kind to plant where a permanent group is wanted. It is usually about three feet high when in bloom with umbels of erect orange-red flowers. *L. elegans* is similar in habit but not so tall when fully developed; the flowers are similar in color but vary in different varieties, of which there are many in catalogues, but the mixed bulbs, as grown by the Dutch, give a pleasing range of color and are exceedingly cheap—in Holland. It should be stated that *L. elegans* is often grown under the name of *L. Thunbergianum*, but *L. elegans* is the older name. The dwarf habit of this species makes it valuable for margins of Lily-beds or borders where shrubs are planted. All are familiar with *L. candidum*, the Madonna Lily; it is perfectly hardy, but we grow it in pots, the same bulbs year after year, for piazza decoration in summer, and the bulbs improve in size. They are rested after flowering and repotted in July, just before growth commences, for in fall this species has green leaves all winter. *L. Harrisii*, the Easter Lily, and *L. longiflorum* are both hardy in sheltered situations with a covering of leaves in winter. The tendency with these two kinds is to start to grow the first year in fall, but after a year or two they forget all about it and come on naturally in spring. The Tiger Lilies are well known as hardy, but the older variety should only be grown to complete a collection, as the kind known as *L. tigrinum splendens* is so much superior to it. The double variety is good for its durability when in bloom, though many do not admire the double flowers. *L. excelsum* of catalogues, more correctly *L. testaceum*, has flowers of a different color from that of any other Lily. This is a light brown or buff, and it is very distinct and ornamental. This Lily should always be planted in a collection, though it sometimes deteriorates in rich soil. In habit the plant resembles *L. candidum*. *L. Chalcedonicum*, the scarlet Turk's-cap Lily, is a native of Greece and is somewhat tender, but in favored localities it should succeed and produce its bright scarlet flowers freely enough.

Of the Japan Lilies, *L. auratum* is, perhaps, the best known, and little needs to be said of it except that I never knew any one to grow the same bulbs long in such health and strength as we receive them in from Japan. The bulbs are cheap, however, and are sure to pay for themselves the first year after planting. There are many varieties of *L. speciosum* (often called *L. lancifolium*), but the best kind is that known as *Rubrum*, which we get from Japan direct, the Dutch variety being much inferior to it in color, and may be considered as being the typical *L. speciosum*. Of white-flowered forms, *Album præcox* is the best, because it always flowers early. The old white kind flowers later, and is sometimes killed by frost while in bud. This section of the Lily family includes varieties among the handsomest of the genus. They are perfectly hardy, increase under cultivation, and are indispensable to the hardy-flower garden. There are other varieties of *L. speciosum* which are but slight variations from the two named, which are the best of the section. *L. Batemannæ* should be named in connection with *L. tigrinum*, which it resembles closely, except that the flowers are not spotted, but are of a clear apricot color, and desirable for that reason. The dwarf *L. Wallacei* has also flowers of a similar color, but does not exceed eighteen inches in height. By some it is considered but a variety of *L. elegans*. The bulbs are always small, but they usually flower freely and increase rapidly. *L. Browni* is a rare variety, with

flowers similar in shape to *L. Harrisii*, but larger, white inside, and purplish brown outside the petals. It is exceedingly fragrant, hardy, but rather expensive, but when once planted in suitable soil does not die out. *L. Kramerii* is a species possessing a refined beauty peculiar to itself, the flowers being of a delicate rosy pink, and borne usually one on a slender stalk. This kind requires careful nursing to induce it to do well, but it is possible to grow and flower it in sheltered positions.

Lilium pardalinum is the only native western Lily that will thrive in the east, but it grows so cheerfully and luxuriantly that it really seems to be making an honest effort to atone for the bad behavior of its companions of the Sierra Nevada. With us it is as free as *L. superbum*, which it resembles strongly, although it flowers earlier. All of the species found in the eastern states, *L. Canadense* and its varieties, *Rubrum* and *Flavum*, *L. superbum* and *L. Philadelphicum* thrive well when planted in the garden, but the last-named should be planted in a dry soil not more than three inches deep. When planted the usual depth *L. Philadelphicum* will surely perish. Of the noble Himalayan *L. giganteum*, I cannot record any success, and have never seen it in bloom, but Mr. Ellwanger's experience with it, as recorded in GARDEN AND FOREST, ought to encourage others, now that we know it can be grown. The bulbs are very large, and often remain dormant a year after

planting, but should start to grow the second year, although with me they did not. Of another East Indian Lily, *L. Wallichianum superbum*, usually considered tender, it is worthy of remark that last June, in Mr. Hunnewell's gardens at Wellesley, I saw a clump that had been outdoors in the open ground all winter, and the growth was vigorous, and promised well for bloom. If Wallich's Lily proves hardy it will be a great addition to the Lily-border, for, under pot-culture, it usually languishes. This and its first cost has had much to do with its rarity in gardens.

Lilies generally do not require a rich soil, in the usual acceptance of the phrase, but a soil rich in decayed vegetable matter is eminently suitable. Hence a compost of good loam and decayed leaf-mould made porous is what is desired. There are some kinds, such as *L. tigrinum*, *L. speciosum*, *L. candidum* and *L. Harrisii*, that like manure both in

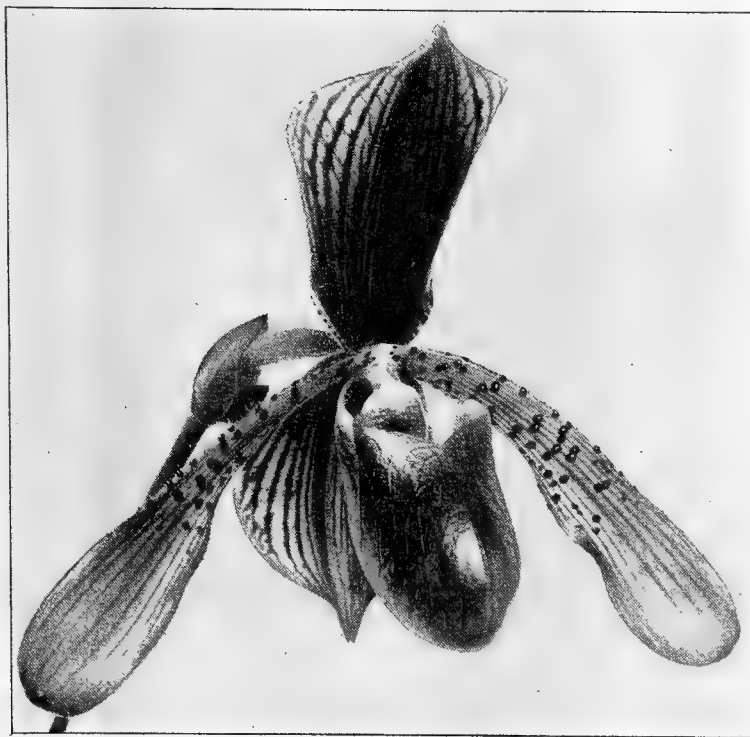


Fig. 79.—*Cyripedium Daisyæ*.—See page 460.

the soil and in the water given, but these are the most vigorous of all Lilies, and the same would not suit any of the more delicate species. The depth to plant Lilies should vary with the size of the matured bulbs. All the larger kinds may be planted the depth of the spade, about nine or ten inches, bearing in mind that the roots that do the most of the work are produced up the stalk between the bulb and surface of the sod, and if the bulb rests on the subsoil it does not matter, so long as the top soil is right. When manure is applied to the soil the bulbs should first be covered with soil free from it, or decay may be brought on by contact. The richer soil should be used for the stem-roots to feed upon. The ideal position for a Lily-bed is among Rhododendrons. Where these will thrive the Lilies will, the taller kinds being used to come up through them, and the dwarf ones near the margin of the beds. The leaves used to mulch the Rhododendrons in winter are a fine protection for the Lily-bulbs, and afford when decayed all the needful fertilizer, while the shrubs shade the surface of the soil and keep it cool and moist in summer, which is a great advantage. A bare surface soil, which radiates heat in hot weather, turns many of the leaves of Lilies yellow, and causes premature ripening of the stems. In common with all other cultivated plants, the Lily has a disease of its own. Some collections, to

my knowledge, have been completely exterminated by its ravages. It attacked our Lilies this season. It remains to be seen what the results will be next year. Rusty yellow patches on the stems and leaves tell of the work going on, and soon the stalk dies off, and the bulb is weakened for next year. I have had no opportunity for comparison, but the symptoms are unmistakable. Apart from this disease, there is no reason why we do not see more Lilies grown in gardens. Enough are forced in one year for Easter to plant bulbs in every garden in the United States, and yet how seldom do we see this family represented, except, perhaps, by a clump of Tiger-lilies that have been undisturbed for a generation, and yet live to flower and plead for attention and encouragement.

South Lancaster, Mass.

E. O. Orpet.

Autumn-blooming Perennial Plants.

CHRYSANTHEMUMS have absorbed so large a portion of the attention of gardeners in recent years that other autumn-flowering perennials have suffered some neglect, and Chrysanthemums are rapidly becoming plants for the greenhouse exclusively. The early sorts give little promise of being out-of-door bloomers, if one may judge from a large collection of the new French strains seen a few days since, which seemed scarcely as forward as the old Madame Desgranges. For a garden of narrow limits the selection of plants for flowers at this season requires more care than for those of spring and summer, as at this time many plants are apt to become rank in growth—weedy, in fact. In selecting plants for conspicuous positions care should be given to obtain those with good foliage, as the weather is at this time very trying to all leaves. The popular Sunflowers are usually quite defective in this respect, and quickly become unsightly. For a suitable position, however, they are, of course, among the attractive flowers of the season. An excellent succession of these is *Helianthus rigidus*, the double-flowered *H. multiflorus*, *H. lætiflorus*, *H. orgyalis* and *H. Maximiliani*, the two latter being especially graceful in foliage, and *H. Maximiliani* is in flower long after the first frosts.

Of the more modest flowers of the season, *Anemone Japonica alba* is easily the most charming, and is usually entirely satisfactory if the position is somewhat moist and not too open. *Delphinium Sinense* seems to me scarcely less beautiful in either of its three colors, white, pink and a heavenly blue. It has a very neat habit, of moderate growth and a long season of bloom. Messrs. Pitcher & Manda had it in flower in November last year in the open nursery. This species should be very popular when better known. The autumnal Monk's-hood (*Aconitum autumnale*) is a plant of very trim habit, two to three feet high, with glistening dark green leaves and abundant large hooded flowers of a pleasing purple. *Stokesia cyanea* has flowers of a lighter purple, like a full-petaled single Aster, though the foliage is not specially attractive. This plant is probably not hardy here without some protection, which is also a drawback to the cultivation of the Torch-lilies, or *Kniphofias*, which have been so much improved, especially by Herr Max Leichtlin, in recent years. There seem about two-score varieties available, these varying in habit and coloring of flowers; few are hardy without protection from wet and severest frost. No good garden is complete without some varieties of these plants, ornamental in foliage and flower. Of the most common varieties *K. corallina* is most likely to give general satisfaction. It is a dwarf kind, of very thrifty growth, and gives a succession of bright torches until frost. They winter without harm in a frame or cellar.

Pyrethrum uliginosum, with its Chrysanthemum-like habit and white daisy-like flowers, is now in season, and likely to prove satisfactory. It should have a sheltered place, where wind will not thresh the fair flowers, which are thin of petal. Another fall daisy is *Chrysanthemum lacustre*, a plant of coarser habit, proof against severe weather, and somewhat of the wilding order. The best composites of the season are the perennial Asters, the varieties of which are so plentiful in our American fields at this season. No plants are more satisfactory in the garden than the best of the Asters, with their bright multitude of flowers. A standard collection of the family, correctly named, in some one of our botanic gardens would be of real interest. At present it is practically impossible to secure even a small collection from two nurserymen which shall be named alike. Were there more room in my garden I think probably there would be added some fine forms of Golden-rod, full as the fields are of them. *Solidago cæsia*, with long wand-like stems and clustered axillary flowers, seems to be the perfection of grace and brightness.

A sowing of Iceland Poppies made early in the year is now flowering freely and vying with the brightest flowers in the

garden. Scarcely less bright is the well-known *Plumbago Lar-pente*, with its blue flowers and foliage, which is taking on bright autumnal tints. *Sedum spectabile* adds color in spots which prove too dry for other plants. *Gaillardia grandiflora* is, perhaps, not strictly a fall flower, but nothing but a hard frost will give a pause to its floral succession. Among bulbous plants, the flowers of the season are from varieties of *Colchicum*, *Crocuses* and *Cyclamen*. *Cyclamen Europeum album*, now showing pure white flowers, would be much more attractive with leaves, but at present there are none. *Cyclamens* are difficult bulbs to establish in the open, and I have not yet discovered why they live through one winter and are pulped the next. The garden is made interesting and expensive by these little experiments. Plants with magenta-colored flowers are not long-lived in my garden, but it seems worth while to make an exception in favor of *Lespedeza Sieboldi*, which has such a graceful habit, with its pendulous branches covered at this time with a myriad of pea-shaped flowers. Roses give such a plentiful daily crop of buds at this season that it seems ungrateful in talking of hardy plants not to mention them, though what I know of them may be summed up very shortly. A man may have Roses in his heart, as the well-known saying goes, but if he wants them in his garden he must set his plants in a good, deep compost (two feet not being too much), rich with manure and bone-meal. *Gloire de Dijon* and *La France*, both of which are hardy with me with no protection, give decidedly more flowers than other varieties which have been grown here.

With all its wealth of showy flowers the September garden seems to me the least interesting one of the year. Crops are a mere detail, not always essential to the enjoyment of a plant. Human beings, as children, are often more interesting to their guardians, filled as they are with wonderful potentialities, than when in full development of maturity. And plants, new or old, in their early growth give pleasurable anticipations which are not always realized. Again, we are in this latitude never free from danger of killing frosts after this date, and garden operations must be shaped with this contingency in view. Then around us is the glamour of the glorious American autumn, tinging the fields and ripening leaves with a wealth of colors overpowering the brightest garden. Seen under a declining sun at this season our Jersey meadows show broad, harmonious and exquisite shadings of color which no expert in bedding-out can hope to rival. When one has perceptions open to these impressions the mere enclosed garden is at this season rather commonplace.

Elizabeth, N. J.

J. N. Gerard.

Cool-house Ferns.

AMONG the many fine Ferns that may be successfully grown in a cool-house, that is, in a temperature forty-five to fifty degrees during the winter, there are few superior to *Hypolepis distans*, an evergreen of much elegance and free growth. This Fern makes a mass of dark green bipinnate fronds about a foot in length; these are finely divided and serrated and thrown up from a creeping rhizome. Like many other Ferns of creeping habit, this species does not require a great depth of soil, and pan culture is therefore advisable. Planted out on a rock-work it is equally at home.

Pteris scaberula is a fine companion plant for *Hypolepis distans*, and thrives under similar conditions. The fronds of this species are also finely cut, lanceolate in general outline and light green in color, and they are produced from slender rhizomes. This admirable Fern is partly deciduous, and is, consequently, likely to become rather rusty-looking during late winter and early spring. But the beauty of the young growth fully repays for any previous shabbiness, and it is well worth a place in any conservatory.

An unusually pretty Fern, and also an uncommon one, is *Athyrium Goringianum pictum*, a variety introduced from Japan some years ago. It has long pendulous fronds, the stems of which are pinkish or red, and the pinnæ on each side of the midrib are variegated with a lighter shade of green, thus making a light stripe down the centre of each leaf. This variety will grow nicely in light loam, if proper attention is paid to the drainage of the pots. The plant is entirely deciduous, and should be stored away under a bench when the fronds die down and watered often enough to keep the soil moist.

Adiantum Capillus-veneris magnificum is one of the best forms of the common Maidenhair, and can be grown into a very pretty specimen, besides having good lasting qualities when used in cut-flower work. This variety has particularly large pinnæ, possibly the largest in the *Capillus-veneris* sec-

tion, and the fronds are gracefully arched. *Todea Africana* is another very fine cool-house species. It makes a short, stout trunk as the plant attains age, from which are thrown up large bipinnate fronds. These are of strong texture and the pinules deeply serrated on the margin, the surface of the fronds being dark green and glossy. It makes a particularly handsome specimen when well grown. It is a strong rooting species and requires an abundance of water to keep it in good condition.

Cyrtomium falcatum is one of the brightest-looking Ferns in a collection; its pinnate fronds have a fresh green color and a high gloss. It is almost hardy, and is quite so in many parts of England, where it is much used for planting in outdoor ferneries, though under such conditions it is almost deciduous, while it retains its foliage in good condition during the winter when grown under glass. *C. caryotidum* is similar to *C. falcatum* in form, but is very different in color. The fronds are much lighter and they are also thinner in texture, and it is less glossy. It is not as hardy, but makes a pretty plant and is readily raised from spores. *Brainea insignis* is a very handsome Chinese species of moderate growth and arborescent habit; the pinnate fronds reach a length of two and a half to three feet. The pinnæ are lanceolate in shape, with serrated edges, and the young fronds are pinkish, gradually turning to bronze and later to green. *Brainea* is a monotypic genus and continues somewhat rare, though a noticeably handsome species.

Among the smaller Ferns, several of the Pellæas are excellent; they are useful for pot or basket culture or for planting in a rockery. *P. rotundifolia* is good, the nearly round pinnæ strung along each side of the dark brown rachis having a very light and graceful effect; a native species from the far west, *P. bella*, is also beautiful, growing to a height of six or eight inches only. Other members of this genus valuable for the cool-house are *P. calomelanos*, *P. brachyptera* and *P. flexuosa*.

Holmesburg, Pa.

W. H. Taplin.

Tomato Diseases.

TOMATO plants have been troubled with fungi this season, and consumers are complaining of the high price and poor quality of the fruit, while the tomato growers are lamenting the short crop. In some localities the young plants were destroyed or much weakened by the bacterial disease known as the Southern Tomato Blight. This has been followed by the old leaf-enemy, *Cladosporium fulvum*, which produces a light brown, almost olive, mold upon the under side of the foliage. Plants with much of this fungus usually bear inferior fruit, and frequently the same enemy appears upon the fruit while it is green and less than half-grown; the blossom end turns brown and decay sets in.

The newest enemy, and one of no small importance, is an anthracnose, *Colletotrichum Lycopersici*, which was first observed by Professor Chester, at the Delaware Experiment Station, last season, and described by him in the *Torrey Bulletin* for last December. This fungus produces sunken spots in the fruit, which become soft and dark. It quickly destroys the Tomato, and for this reason and by its peculiar appearance it is usually recognized as different from any other known Tomato rot. Several times my attention has been called to the ravages of this parasite by growers who observed that it was a new enemy.

The same fungus is to be found upon the foliage, when it causes brown, irregular spots. At this time, when the fruit is well advanced and frosts are expected daily, there is little or nothing to be done, except to see that the vines are finally gathered and burned. There is no question about the contagiousness of the anthracnose. The spores are numerous, and should be destroyed at the close of the season, if not before.

Rutgers College.

Byron D. Halsted.

Hardy Cyclamens.

MR. EDWARD WHITTALL, writing to the *Mayflower* on the Cyclamens of Asia Minor, says:

The Cyclamen is another plant which has proved of interest to me as a collector. A few years back I believed that it was represented in Asia Minor by *C. Europæum* alone and I was accordingly well pleased to find that many varieties existed. *C. Europæum*, as I have no doubt your readers well know, blooms before any of its beautiful ivy-like leaves appear above ground. All the hedges around Smyrna are full of it, and with the first dews of September its pretty pink-white flowers appear to remind us that autumn is nigh and we have done

once again with our hot, dry summer. If we could cap the remarkably beautiful foliage of *C. Europæum* with its numerous and large blooms, what a pretty plant would be the result.

On the sea-coast between the promontory opposite the Island of Chios and the headlands opposite that of Rhodes, I found what I believe must be *C. macropus*. The foliage of this variety, though not so massive as the first-mentioned, is prettily marbled, in some cases almost silver-white, which, joined to numerous and pretty pink-white flowers, makes of it an acceptable plant for house-decoration from December to March. It has, therefore, the merit of being easily bloomed a month or so before the beautiful English hybrids now so much under cultivation. This variety is called in Smyrna the large Rhodian, as it was first brought from that island, where it grows abundantly.

Following up this clue, one of my men came across what I should say is *C. Ibericum*, at the foot of the Anti Taurus, Boulghar dagh and Allah dagh ranges, a few miles from the town of Adana. The leaves of this plant are smaller and not so pretty as in the large Rhodian, but the blooms, which are purple-crimson, with a very dark eye, make it a good acquisition. It flowers in March.

My prettiest finds, however, date from 1891, viz., two dwarf Cyclamens. The first, like *C. Europæum*, flowers in autumn, throwing up its whitish pink blooms almost before its pretty marbled leaves. The bulbs rarely exceed an inch and a half across, and when taken out of the soil are of a glossy flesh-color; quite distinct from any others of the genus found in these parts. The leaves are small, barely three-fourths of an inch across.

The second dwarf I consider a gem for rockeries. The bulb, like that of the first, is small, even smaller, flesh-colored and glossy. The leaves are prettily marbled, and more delicate than in the first. They grow so thickly on the plant that in the numerous specimens I grew this year I had not one plant in which the foliage measured more than four inches in diameter. This was surmounted by a numerous set of very large blooms, as compared to the foliage, of a dark red or purple with an almost black eye. I have seen Coum and other dwarf varieties, but I believe none come up to this miniature Cyclamen, either in size or floriferousness. Both these dwarfs were found on the western spurs of the Taurus, above the towns of Adalia (the ancient Attalia) and Phœnicia, and as they were discovered peering out of the snow at an altitude of 3,000 to 4,000 feet they will probably prove hardy.

Correspondence.

Early Autumn near Cape Cod.

To the Editor of GARDEN AND FOREST:

Sir,—I should much rather write myself down as living on Cape Cod than near it, for there is a distinctiveness, not to say distinction, in its name, a share in which all its neighbors covet. Every one knows where Cape Cod is, and thinks he knows what it is, although accurate knowledge on this latter point is, as a fact, extremely rare, while to say that one lives on the western shore of Buzzard's Bay conveys a very vague idea to most persons of other than New England birth.

However, though we are only three miles to the westward of the Wareham River, on the eastern bank of which Cape Cod begins, no one worthy to speak to the readers of GARDEN AND FOREST could claim to belong to "the Cape." For its nominal beginning is a true geographical beginning, and this means a distinct botanical beginning, or, more exactly, a distinct botanical leaving off. Everything that grows on Cape Cod grows here, from Cranberries to Pitch Pines. But many things grow here which do not grow beyond the Wareham River—White Pines, for instance, in profusion. And many other things flourish here which just cling to existence there, so that the whole aspect of our woodlands and road-sides is different; and as one drives still further to the westward, the difference grows ever more strongly accentuated, so that even five or six miles from the shores of the bay one can hardly believe that the sandy, heathy, boggy, rough-and-tumble stretch of the Cape country is covered by the same sky which covers these verdant rolling meadows, the sturdy Oaks and Maples and White Pines of the woodland, and the great Poplars and Locusts by the cottage-doors.

So, we think, we are repaid for not belonging to the Cape by the variety which our daily excursions can compass. The Cape is delightful, but it is all of a piece, and those who live on it cannot easily go elsewhere. But we can go to the Cape after dinner and be back to tea, and the next day can go to our pas-

toral inland country in an equally brief space of time. Nor do we always think that we must go far in either direction, for even the roads nearest about us offer perpetual variety, now crossing salt-marshes and causeways over rippling arms of water; now threading tall Pine-groves, and now Oak-thickets, to bring us out on modest elevations, which we are pleased to call cliffs, where, suddenly, the wide azure expanse of the bay is seen beneath our feet; now taking us between hay-fields and small fruit-farms, where the houses are prettily gray or white and the barns are bigger than the houses; and, again, leading us through miles of narrow roads, where woods of some twenty years' growth come close to the carriage-wheels, the boughs meet overhead, and the grass grows tall between the three ruts worn by the never frequent, but never altogether failing passage of the typical vehicles of the country—the shakily, faded buggy and the black-hooded, four-seated carryall, each drawn by its single horse. Two-horse conveyances cannot comfortably penetrate these wood-roads, although for a one-horse vehicle they offer very good driving, the sandy soil of the Cape only appearing here and there in very brief stretches. No visitor should bring his own one-horse vehicle to this part of the world, but should depend upon those he will find awaiting him. Our axles are so wide that an imported carriage does not "track," and the difference between driving in such a one and in one which does track is the difference between entire comfort and an exasperating tilt and joggle.

Of course, it is in the mountain regions of central and northern New England that the colors of the American autumn show in the grandest and most amazing way. But our vegetation "turns" very beautifully; and it reveals its beauty, so to say, in a much more intimate fashion. The finest autumnal features of an inland scene are distant stretches of parti-colored hill-side, tall, broken masses of variegated forest in the middle distances, and, sprinkled about in the nearer meadows, superb single examples of flaming red or yellow or purple trees. But we have no hill-sides; when we see a mass of woods in the middle distance it is low and draws a nearly straight line across the horizon; and, in our most characteristic drives, the trees are small, and one sees them very close at hand, crowded beside us, and their boughs close above our heads. Here and there we get fine open views of meadows and marshes bounded by woodland or sea. But they are all flat views, and, as a rule, there are few isolated large trees. The colors in autumn lie in low far-extending level masses, or, when we thread the forest-roads, strike the eye as a perpetual succession of details, rather than as broad effects. Roads such as these are called, I believe, "green-ribbon roads" in some parts of New England. Ours are certainly ribbon-like, perpetually and gracefully meandering with never the smallest stretch of straightness, and in summer they have a green all their own, for no inland light brings out the keenest emerald tints possible to foliage as does the salt-spangled light of these sea-shore parts. But when we look along them in autumn we feel as though we had put an immense kaleidoscope to our eye, so many are the colors they assume, and so impossibly vivid each one seems.

Of course, it is not in the first half of September, not until October, that, in these mild regions, one sees autumn in a very brilliant guise. But the beginning of the red and yellow season has a special charm of its own. Autumn is setting her palette, trying her effects with little streaks and spots and splashes, indicating what she means to do, sketching in her color-scheme; and every one knows that a great artist's sketches have a peculiar value to the understanding eye. A tricky and willful sprite is this particular great artist, in those youthful days when her Christian name has not been changed from "Early" to "Late." There seems no reason in her work, although everything she does rhymes delightfully with the next thing. I pity any scientific student who should come to our woods in mid-September, trying to unravel why our foliage "turns." Neither frost, nor sun, nor moisture, nor dryness can be credited with any distinct influence; little can be laid to the account of family traits when tree is compared with tree; nor does soil or situation seem to have a discernible effect upon the gay beginning of the masquerade.

We may say, in a rough sense, that the Tupelos turn first. But some of them turned in August, and some have not yet begun to turn, while some are russet and others are redder than scarlet. And a green one may stand close beside the brightest red one, or one bough may be scarlet while all the others are emerald still. But even the Tupelos are not so individually willful as the Maples. They are all Scarlet Maples by name (the Sugar Maple does not grow with us), but they are not all equally scarlet by nature; or, at least, they do not

all reveal this nature at the same time or in the same way. This year they began to enliven themselves unusually early—a week or more ago many of the smaller ones were already vivid. But I have never noted a year when they enlivened themselves in so fragmentary and fantastic a fashion. It is hard, as yet, to find an example which is red all over. I passed a wide swamp the other day which was surrounded by hundreds of them and thickly beset with others, all hardly more than saplings, gracefully tall and slender. Every one of them, I think, showed some brilliant red; but not one of them, as far as I could see, had more than one or two red boughs. It was not as though each tree had assumed a new garment; it was as though each had flung out a bold banner of its own. Often, in the narrow woodland roads, one comes upon a Maple with not a whole bough, but merely the end of a bough flaming; or not the whole end, but just a couple of swinging leaves. In my drive to-day I came upon a good-sized symmetrical specimen, still perfectly fresh and green, with one single scarlet leaf hung out over the roadway; and immediately beyond it was another with only half a leaf tinted, the line between green and red being as neatly drawn as though by a painter's brush. And as the Maples are behaving, just so are the Scarlet Oaks, while their big brothers, the White Oaks, give no sign that they know the summer is past.

Where the roads skirt the salt-marshes splendid effects of color may already be seen, although these are less vivid than those which will soon follow. The marshes (we call them "ma'shes" here, and so, says an English friend, are they called in South Devon) are not orange-colored yet, but they are a fine dullish yellow, streaked with green and brown, and here and there accented by big patches and ribbons of a blood-like deep red. From a distance the plant which gives this remarkable color looks like some species of *Salicornia*, but I have never been able to get near enough on the yielding soil to see it distinctly. Around these marshes the woods are still chiefly green. No brown tones yet appear, and of yellow tones only the dull neutral tints of the little Birches. But a splash of scarlet shows occasionally where a Maple or Tupelo stands with its foot in the wet.

Where the roads go beneath tall Pine-groves not a sign or symbol of autumn appears. The sparse growths beneath are as freshly verdant as the soft swirling canopy of needles above. But the open roadsides are gay, for we pride ourselves on our variety in shrubs and vines, and these turn early; and, moreover, the Asters and Golden-rods are still at their finest. No withered grayish plumes stand for the Golden-rod yet, but along the shores the thick-leaved maritime species is in perfection, and on drier spots other tall or low paniculated kinds, and the softer, more poetic flat-topped masses of the corymbose species. The *Vacciniums*, which later will spread a carpet of glory along the roadsides and through the woodland glades, are already, some of them, bronzed and some of them red. Here and there a *Clethra* has turned bronze-like too. Once in a while we come upon a little *Sassafras* whose mitten-like leaves are yellow and red in spots like a particularly speckled apple. Now and then, like a flash of flame, a thin garland of Virginia Creeper encircles a Pine-tree trunk; near it flaunts a mass of Poison Ivy, and, further on, a streamer of *Smilax* tries to make us believe it is a Virginia Creeper too. Sometimes, lying low beside the road, beneath an arboreal canopy still entirely green, there is a mass of varied tangled color enchanting to behold; and, again, the undergrowth is as green as the trees, except for tiny spikes and spots of russet and scarlet.

The eye which can appreciate accents as well as broad effects, which loves details as well as masses, and which can be delighted by a little colored leaf as well as by a huge colored tree, finds infinite satisfaction in our country in these early autumn days. And what a sky covers this diversified panorama of simple beauties! People who live among the hills must do without real horizons. They never know what it is to see the edge of their world in every direction, and to know what the sun's rays are about in all quarters of the sky. They never see a sunset as we see it here all around the margin of the heavens. This is particularly the month for sunsets, and we usually have four of them every night. There will be a crimson one flaring in the west and a rosy one blushing in the east; one with masses of dark purple clouds lying over a purple sea to the southward, and a colder, purer, even more enchanting one in the north, pale green as to its sky, palest lavender as to its clouds. No mountain region can do this for you, and you must come to our individual little corner of the world, just under the heel of Cape Cod, to know exactly what you miss by living in the mountain.

Marion, Mass.

M. G. Van Rensselaer.

Scab-proof Apples.

To the Editor of GARDEN AND FOREST:

Sir,—In the line of Professor Bailey's statements (p. 442) it is deplorably true that in Wisconsin this season none of our market apples are without injury from scab. Never were prospects finer at blooming-time for a bountiful harvest of apples than last spring, but in the latter part of June, the scab fungus, stimulated no doubt by the cool, wet weather, spread over our orchards in a surprisingly short time, causing almost a total ruin of the prospective crop. The few apples that remained on the trees are so badly scabbed that not many of the samples shown at the state fair this year were unblemished.

But in this season of almost omnipresent scab, Mr. George J. Kellogg, of Janesville, Wisconsin, exhibited a well-laden branch of a new seedling Apple, which, though grown in an orchard in which the profuse bloom of last spring was almost completely blasted by the scourge, had developed a fine crop of apples that were as free from scab-marks as if no germs of this disease had ever alighted upon them—a pleasing evidence that scab-proof apples may not be among the impossibilities.

The "squirt-gun" has, no doubt, come to stay, but I have little hope that in seasons when we most need its help, that is when profuse showers are frequent in the month of June, it will ever be able to give us fair fruit. We must supplement it by systematic breeding from scab-resistant varieties before we shall escape damage from this most serious scourge of the orchard.

University of Wisconsin.

E. S. Goff.

Recent Publications.

Garden Design and Architects' Gardens. By W. Robinson, F. L. S. London: John Murray, 1892.

The illustrations in this little book are in themselves of sufficient interest and value to justify its publication, and the author himself seems to consider them the essential part of the work, if we are to judge from the sub-title, which states that it is his purpose "to show, by actual examples from British gardens, that clipping and aligning trees to make them 'harmonize' with architecture is barbarous, needless and inartistic." A proposition of this sort needs little argument to substantiate it, and little argument will the reader find. Mr. Robinson's work, in form, is principally a review of *The Formal Garden in England*, by Bromfield and Thomas, with a short additional criticism of *Seddings' Garden Craft, Old and New*. In reality it is an impassioned protest against some of the false doctrine of these two works—and plenty of false doctrine do they set forth.

The first of these books has been already reviewed in these columns. It is rather an attractive little treatise, and, begging Mr. Robinson's pardon, it contains many pretty and interesting pictures. The authors have our sympathy, too, so far as they show a preference for old-fashioned, geometrical planting over much of the formless fussiness of many modern gardens. The fundamental error of the authors is, that they appear never to have seen a good example of grounds that have been treated "naturally" and at the same time artistically, or if they have seen such places they do not appreciate their beauty. Indeed, there is nothing in the book to show that the authors have any feeling for natural beauty or any intelligent appreciation of scenery. It is charitable to assume that they are quite destitute of the original faculty to which the beauty of scenery appeals, and the mistakes of their book are exactly of the kind which would be made by a man with no ear for music, if he should write a criticism of Beethoven's Fifth Symphony. The lack of this special sense will account for the assertion that landscape-gardening is essentially the abandonment of everything like design. They can see no "order" or "balance" except in the repetition of architectural lines and angles. It is not strange, therefore, that they should fall back on etymology and insist that the essential feature of a garden should be a strong boundary line.

Mr. Robinson's pictures need no additional text to show how delightful to the eye the so-called natural style of planting can be made, even in connection with buildings, whether stately or humble. And the text adds little to the force of the illustrations. Mr. Robinson's language is fervid, and at times perfervid, but a display of feeling does not always aid an argument. As has been already said, however, little argument is needed to demonstrate the errors into which the two young architects fell when they essayed to prove that one kind of garden was essentially good, and all others essentially bad. The fact is, that there are gardens of a good many kinds, and gardens made to fulfill a good many different purposes. Mr.

Robinson himself is the able advocate of a garden whose "true use and first reason is to keep and grow plants which are not in our woods, and are mostly from other countries than our own." But, then, there are gardens whose beauty is of the very highest type which were not designed with any such motive.

Bulletin 43 of the Cornell University Experiment Station treats of certain "Troubles of Winter Tomatoes," two of which are so obscure in their ways that growers often fail to recognize them until the crop is ruined. One known as the winter-blight was first described in GARDEN AND FOREST last April (page 175) by Mr. E. G. Lodeman. The disease first appeared in the winter of 1890-91, when only a few plants were affected, and as they had borne one crop it was thought that they were simply worn out. It became necessary, however, to carry a dozen plants over the summer, and these were introduced into the house when the forcing season opened last October. From this stock trouble again spread, and in six or eight weeks it had become serious, and there was no longer any doubt but that a specific disease had to be contended with. The first indication of the trouble is the dwarfing and fading of the leaves and the appearance of ill-defined yellowish spots, which soon become dark and the leaf curls, with its edges drawn downward, so as to give the plant a wilted look. This injury causes the plant to dwindle, fruit-production is lessened, and in some cases the plant dies outright. The indications point to a bacterial origin for the disease, but this is not certain, and no remedy has been found for it as yet. The disease travels from plant to plant when they stand in separate boxes, even when their tops do not touch. Experiments lead to the conclusion that the best treatment for this blight is to remove all diseased plants at once, and if it becomes serious, to remove all the plants and soil in the house and start anew. The experiments, too, emphasize the importance of starting with new plants and fresh soil every autumn. When once the disease gets in a house it seems fatal to success in forcing Tomatoes.

The common blight which is associated with Tomatoes, *Cladosporium fulvum*, appears as cinnamon-brown spots on the under surface of the leaves. This fungus, however, is rarely serious. It is apt to appear in late winter or early spring, and often not until after the crop is nearly harvested. In such cases the old plants should be burned as soon as the last fruit is off. If it appears earlier, spraying with the ammoniacal carbonate of copper is to be recommended.

Another serious injury of winter Tomatoes is the root-gall which comes from nematodes. Many plants like Geraniums, Coleus, etc., are subject to the attacks of these worms, and the diseased plants or the soil in which they grew is often dumped into the dirt-bin, and thus the trouble is propagated. In the southern states these nematodes are serious enemies to plants in the field and even to trees, but in the north they are confined chiefly to indoor plants. This indicates that the freezing of soil in houses which are attacked would be good treatment. When these worms attack Tomatoes the root is swollen into a shapeless mass which reminds one of the club-root of cabbage. The trouble is likely to be worse in plants which are carried over from one winter to another. In general appearance the injured plants resemble those attacked by the winter-blight except that the leaves are not spotted. The best treatment for this disease is to remove plants and soil, wash the benches and boxes with lye, and begin over again. It would, however, be a great saving of time and expense if the soil could be treated between crops with some material which would destroy the worms. Lye, quicklime and bisulphate of carbon have been tried unsuccessfully, but in boxes of earth which were salted and frozen no worms could be found.

Notes.

In consequence of the growing difficulty of procuring wood suitable for the manufacture of matches, German factories are now making them of compressed peat, which is said to be an excellent substitute.

According to a foreign journal, almonds are now counterfeited as coffee-beans are imitated. The artificial almond is made of glucose; color and form are copied to perfection, and the desired perfume is given by an application of nitro-benzine.

Anjou, in the Department of the Maine and Loire, in France, is a headquarters for the cultivation of medicinal plants. The ground is a slaty schist, and such plants as Belladonna, Camomile, Stramonium and Hyssop flourish well in it, and are grown on a great scale, and, according to an account recently given in *Le Jardin*, of Argenteuil, with large profits to their cultivators.

The first large exhibition ever held in Bulgaria was recently opened at Phillipopolis on a site known as the "Garden of Roses," which was formerly a Turkish cemetery, and is described as being beautifully disposed with avenues of fine trees, sheets of water and ornamental flower-beds. The most interesting feature of the show is said to be the Government exhibit of forest and garden products.

It has often been told that the Horticultural Hall on the World's Fair grounds at Chicago will be the largest building ever devoted to a purpose of this kind. But perhaps a new idea of its size will be gained from the statement that it will contain as much space as the combined areas of the horticultural halls which served at the Centennial, at the New Orleans Exhibition, and at the Paris one of 1889.

Particularly stringent laws exist in Switzerland for the protection of fruit-trees from animal and vegetable parasites. No man is allowed to treat his trees as he chooses, but a strict watch is kept over amateur as well as professional horticulturists. Even the Mistletoe, which frequently grows on Appletrees in this country, is regarded as a possible pest, and proprietors are obliged by the local authorities to free their trees from it at stated intervals.

An article in a recent number of *Gartenflora*, describing the alterations and embellishments recently effected in the famous gardens of Sans Souci, near Potsdam, says: "The view from the great fountain up the terraces to the palace of Sans Souci was being gradually shut off by the growth of the great American Arbor-vitæ (*Thuja occidentalis*). Therefore the trees have now been reduced to a height of about four and a half metres, and the uppermost twigs which remained have been skillfully gathered together with wires so as to form new tips. The observer notices no sign of this treatment, for the effect is entirely natural."

According to the Board of Trade reports, barks and bark-products to the value of £1,965,835 were imported into England in the year 1888. Of this amount a larger proportion represented cork-bark than any other kind, chincona-bark coming next, then extracts for tanning and dyeing, then tan-bark, and lastly cinnamon to the value of £44,061. The oak-bark produced in England itself during the same year was valued at £1,200,000, and the larch-bark at £200,000. The total amount of extent of the trade done in barks would, moreover, be perceptibly increased had numerous less important kinds, imported in small quantities, been included in the estimate.

A correspondent of *The Tribune* writes to complain that the English language has no word to describe the parcel of land on which the ordinary suburban residence is built. He dislikes the word "yard" for the strip of ground in front and on either side of such a house as utterly inadequate, and yet the word "lawn" is often inappropriate, for the place may not be a lawn. It would be absurd to call a fifty-foot lot by such a high-sounding name as "grounds." The word "lot" will hardly answer, as it is even more absurd to invite one's family to sit in the lot than to sit in the yard; especially is this so when there are two or three lots in the enclosure, if indeed there is any enclosure at all.

In many small Mexican towns primitive methods still exist in relation to the land; the town stands in the centre of a square league, which is held in common, and a certain space for cultivation is assigned to each householder. In the *American Architect and Building News* Mr. Sylvester Baxter writes that the orchards near one of these towns were separated from the intersecting lanes by high walls, and in each was usually a little house with a steep roof of thatch. The granadilla, the luscious fruit of a species of the Passion-vine, grew here in abundance. The fruit has a rich yellow shell, the shape and size of an egg; inside is a delicate pulp with seeds, something like the pulp of a gooseberry.

A Belgian horticultural journal notes as one of the most interesting and beautiful of recent novelties a new variety of the sweet-scented Centaurea (*C. suaveolens*), which is called by its introducers, Messrs. Dammann & Co., Centaurea Margaritæ. *C. suaveolens* has citron-yellow flowers, and a variety exists with larger light purple flowers. But the new variety is described as much more valuable, for its flowers are remarkably large, pure white, and most delightfully perfumed. "As to its culture," says our authority, referring to Belgian conditions, "the seed may be sown in April under glass, or in May out-of-doors. They do well in any kind of garden-soil which is not too strong or clayey, and they may be treated as annuals or biennials."

We have occasionally spoken of *Benthamia Japonica*, a shrub or small tree which was introduced some years ago to American gardens through the Parsons' nursery at Flushing. The flowers resemble those of our flowering Dogwood, to which it is related, although its white satiny bracts are more sharply pointed and somewhat narrower. It differs from our Dogwood in one particular, and that is, it flowers much later, and after the thick glossy leaves have attained their full size. Mr. Parsons has just sent us a few sprays of this plant, which is now in fruit. These fruits are borne on stems which are about two inches long, and they very much resemble a medium-sized strawberry in color and shape, and add much to the ornamental value of the tree. In *Benthamia fragifera*, a nearly allied Indian species, the berries, although they ripen in October, frequently remain on the tree throughout the winter. It is not likely that the fruit of the plant in question is so persistent. The flesh is soft and sweet, and will no doubt be a delicate morsel for the birds.

In a recent letter to *The World*, of this city, Mrs. Van Rensselaer writes that in one part of the South Park, Chicago, there is a long sloping bank of grass whereon the designer of pattern-beds has been allowed to do his worst. Here, for example, is a calendar with year, month and day wrought in gaudy colors and of great size, and every day the gardener makes such changes as will keep him abreast of the sun's revolutions. There is an arm-chair of House-leeks, colossal in size, which stands upright on the ground as a true chair would stand, and similarly constructed are two row-boats, each with its House-leek oarsman of life-size. There is a portrayal of the "Gates Ajar" and a literal piece of carpet-bedding, a roll of gaudily patterned carpet done in flowers, resting on the top of the bank and unrolling several yards of its length adown the slope. Of course, these sights are prepared for the supposed delectation of the public. But no one appeared to admire them, and a few stopped to jeer at them, while crowds constantly surrounded the little ponds in Lincoln Park, where some Water-lilies, Lotus and other beautiful aquatic plants were growing in natural disarray.

Several of the state experiment stations are making efforts to organize an intelligent warfare against weeds by publishing illustrations of the most noxious kinds, together with descriptions of their habits. This effort will be helped by the collection of weeds which Dr. Halsted is making for the Chicago Fair, and undoubtedly state agricultural fairs will follow the example and display collections of the weeds which are locally injurious. It has long been urged that instruction in this matter should begin in the public schools, where the gathering of collections of weeds by the children could be made both a pastime and an instruction. In Germany, wall-maps are hung in the schools with colored pictures of the most pestilent species at all stages of their growth, and the way in which their seed is distributed. One danger of such a practice would be that the child would be bewildered by the great number of species. The best plan would be to take up, to begin with, only a score or so of the worst weeds of any section and study them until they become so familiar that they can be identified at any season. Their character and habits should then be mastered, for treatment which might exterminate a perennial would leave the ground full of the seeds of an annual in the best condition to germinate next spring. When the child learns how the plant is reproduced—whether from seeds, roots, bulbs—when the seed ripens, how it is scattered, and acquires other information as to the plant's history and habits, he will be prepared to attack it in its most vulnerable point, and he will get a practical knowledge of a good many valuable truths in the science of botany at the same time.

Catalogues Received.

H. S. ANDERSON, Cayuga Lake Nurseries, Union Springs, Cayuga Co., N. Y.; Wholesale Trade List of Fruit-trees and Small Fruits; Root Grafts; New and Hardy Grapes; Ornamental Vines, Shrubs and Trees; Roses.—P. J. BERCKMANS, Fruitland Nurseries, Augusta, Ga.; Fruit and Evergreen Trees; Roses.—R. DOUGLAS & SONS, Waukegan Nurseries, Waukegan, Ill.; Wholesale Catalogue of Hardy, Ornamental and Evergreen Trees; Forest and Ornamental Tree Seedlings; Tree Seeds.—WM. ELLIOTT & SONS, 54 & 56 Dey Street, New York; Bulbous Roots and Seeds for Fall Planting; Pot-grown and Layer Strawberry Plants.—H. M. ENGLE & SON, Marietta, Pa.; The Paragon Chestnut.—JOHN R. & A. MURDOCH, Pittsburgh, Pa.; Fruit and Ornamental Trees; Flowering and Ornamental Shrubs and Vines; Bulbs.—A. J. ROOT, Medina, O.; Boxes for Farm Produce.—SCHLEGEL & FOTTLER, 26 So. Market Street, Boston, Mass.; Bulbs for Fall Planting.—G. L. TABER, Glen St. Mary Nurseries, Glen St. Mary, Fla.; Fruit, Shade and Ornamental Trees.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLES:—The Islay. (With figure.)	469
Statues in Parks.	470
Overland in the Cayuga Country.—IV.	Professor L. H. Bailey. 470
Shongum.—II.	M. H. P. 471
NEW OR LITTLE-KNOWN PLANTS:— <i>Aster sericeus</i> . (With figure.)	472
FOREIGN CORRESPONDENCE:—The Chiswick Garden in England.	V. C. 473
CULTURAL DEPARTMENT:—The Cultivation of Tuberos Begonias.	475
Tuberos Begonias as Bedding-plants.	C. L. Allen. 476
Planting Perennials.	E. O. Orpel. 476
Water-lilies.	J. N. Gerard. 477
Decay of Quince Fruit.	Professor Byron D. Halsied. 477
CORRESPONDENCE:—Frozen Chrysanthemums at the Royal Aquarium,	Louise Dodge. 478
Cannas at Bay Ridge, New York.	J. N. Gerard. 478
RECENT PUBLICATIONS.	479
NOTES.	480
ILLUSTRATIONS:— <i>Aster sericeus</i> , Fig. 80.	473
The Islay (<i>Prunus ilicifolia</i>), Fig. 81.	475

The Islay.

ONE of the natural divisions into which botanists divide the great genus *Prunus* is distinguished by the ever-green foliage of the species referred to it, which, unlike other plants of the genus, produce their flowers in racemes developed from the axils of the leaves of the previous year, and yield fruit with very thin flesh and large thin-walled smooth rugose or reticulate-veined stones. To this group is given the name *Laurocerasus*, an ante-Linnæan name of the typical plant of the section, and its Linnæan specific name. *Laurocerasus* is a tropical and sub-tropical group, and is more widely scattered over the surface of the earth than any other of the natural divisions of the genus. It is largely represented in the Indian Archipelago and in South America; it occurs in southern China and Japan, in India, in the West Indies and Mexico, while in the United States three species are found. Of these one, an inhabitant of Brazil and the West Indies, finds its northern home on the shores of Bay Biscayne in Florida; the second is distributed through the maritime regions of the southern states, and the third is Californian.

To gardeners, the most familiar plant of the group is the so-called English Laurel, *Prunus Laurocerasus*, the type of the section and a native of the Orient, whence it was brought two centuries ago into European gardens, which it has done, perhaps, as much to decorate as any other plant. As a garden-plant the narrow-leaved Portugal Laurel, *Prunus Lusitanica*, a native of south-western Europe and the north African islands, among broad-leaved evergreens, is only second in popularity to the English Laurel in the parks and gardens of temperate Europe. Unfortunately these handsome plants are not hardy in the northern United States. In our southern gardens they are replaced by the so-called Mock Orange, the indigenous *Prunus Caroliniana*, a tree which sometimes grows to the height

of thirty or forty feet, and produces lanceolate acute lustrous leaves, short erect racemes of white flowers with conspicuous orange-colored stamens, and oblong black fruit half an inch in length. This tree may be found in the immediate neighborhood of the coast, growing in deep, humid bottom-lands from the valley of the Cape Fear River in North Carolina, to that of the Guadaloupe River in Texas. In the south Atlantic and east Gulf states it is not particularly common, but it abounds in eastern Texas, where it grows to its largest size, and sometimes forms impenetrable thickets in the neighborhood of streams. The leaves and young branches of this tree, like those of many of the species of *Laurocerasus*, contain at the period of active vegetation considerable quantities of hydrocyanic acid, making them dangerous to animals browsing upon them. The partially withered foliage is particularly dangerous, and a city ordinance of Mobile prohibits people from throwing into the streets the clippings of hedges of the Mock Orange. This Cherry-tree appears to have been one of the first native plants used by the settlers on the southern coast to decorate their homes, and now there are few southern gardens that are not beautified by a hedge or by a group of *Prunus Caroliniana*.

In California, *Laurocerasus* is represented by *Prunus ilicifolia*, the Islay, or, as it is sometimes called, the Spanish Wild Cherry and the Mountain Evergreen Cherry. It is a small tree twenty or thirty feet high, with a short stout trunk sometimes two feet in diameter, although generally much smaller, covered with thick dark red-brown bark. The branches are stout and spreading, and form a handsome, rather compact head. More often the Islay is a shrub rather than a tree, and sometimes, when it grows on the dry gravelly slopes of the southern coast-ranges, its stunted stems only rise a few inches above the surface of the parched soil. The leaves are beautiful, large, dark green and very lustrous on the upper surface, and usually sharp-toothed like the leaves of the Holly—a peculiarity to which this tree owes its specific name. The flowers in slender racemes, sometimes three inches long, are conspicuous from the bright orange-brown color of the large cup-shaped calyx, the small petals being pure white. The Islay flowers profusely, and the contrast between the color of the flowers and that of the foliage is strikingly beautiful. The fruit, too, is ornamental; it is sub-globose, sometimes two-thirds of an inch in diameter, and dark red when first fully grown, becoming dark purple or nearly black at maturity.

The Islay is a native of the coast-region, from the shores of the Bay of San Francisco to Lower California, extending inland in southern California to the western foot-hills of the San Bernardino Mountains, and preferring the neighborhood of streams, where, in moist sandy soil, it attains its best dimensions. It grows, too, on Santa Cruz and Santa Rosa Islands, off the California coast, where a form peculiar for its usually entire leaves has recently been discovered.

It was David Douglas, the hardy and intrepid Scotch botanist, the discoverer of some of the noblest trees of western America, who found the Islay sixty-odd years ago growing in the neighborhood of Monterey, although it was not properly described until some years later. Long before the days of Douglas, however, the Catholic Fathers, who penetrated California from Mexico and were the first white men to obtain foothold in that region, appreciated the beauty of the Islay and planted it in their gardens. They were wise in their generation, for, with the exception, perhaps, of the Great Magnolia, the *Tolou* (*Heteromeles arbutifolia*), another California tree, the *Umbellularia*, the *Madroña* and some of the *Rhododendrons*, North America does not possess a more beautiful evergreen tree. But the successors of the Spanish missionaries are less appreciative of the value and beauty of the flora of the Pacific coast, and, neglecting the plants nature has prepared for them, hunt through the antipodes for material which as often disfigures as beautifies their homes.

The Islay is an easy plant to cultivate; it grows with such rapidity that we are told of seedlings in the nursery of the Leland Stanford, Jr., University only three years old eighteen feet in height with heads fifteen feet in diameter. No plant is better suited to form an impenetrable hedge or to decorate a garden, and when California has passed through the stage which every new country experiences in gardening, of believing that exotic plants are better than the native products of the soil, the Islay will become one of the best ornaments of California gardens. Unfortunately, it is not hardy in the eastern states or in northern and central Europe, although on the shores of the Mediterranean it is apparently as much at home as on those of the Bay of Monterey.

The illustration on page 475, representing a wild specimen, is made from a photograph which has been obligingly sent to us by Mr. E. L. Woods, of San Francisco.

THE danger that the Central Park will be overcrowded with statues and other monuments increases from year to year; and, despite the fact that greater care is now taken than was taken even a few years ago to exclude those of an inartistic kind, public sentiment is still not sensitive enough on this point; and as long as public sentiment does not sustain them, the difficulties with which the Park Commissioners have to contend in deciding with regard to suggested monuments must be very great.

No statue ought to be admitted to a public park unless it satisfies the taste of competent judges, for poor works of this kind do injury alike to the memory of those whom they profess to honor, to the reputation of those who bestow them, to the best interests of the public, and to the beauty of the great pleasure-ground itself. Still more. The mere fact that a statue is intrinsically good does not always justify its admission to the Park; it must be not only good, but good as an ornament for a park. And, moreover, it must be appropriate to the special site selected for it; or, to turn this fact the other way, an appropriate site for it must be selected. There are certain situations in a park where no statue or monument would look well, and there are others where a work of one kind would look admirably well, while a work of another kind would injure the effect of its surroundings while not appearing to good advantage itself.

The more formally arranged portions of a park are, of course, those where works of sculpture or of architecture, or of the two combined, are most appropriately placed. We are glad, therefore, to learn that the Park Board, while recently accepting the suggestion of Mr. Calvert Vaux, their landscape-architect, that a proposed Thorwaldsen statue be placed near the park entrance at Sixth Avenue and Fifty-ninth Street, at the same time approved his general recommendation that the Fifty-ninth Street frontage of the Park be borne in mind as the station for monuments which may be offered in the future. Here, between the trees which border the sidewalk in a symmetrical line, such objects can certainly be placed to better advantage than in any of the naturally treated portions of the Park. And, if such a change is feasible, we should be glad to see carried out the further suggestion that some of the statues already standing in the Park be removed to the sidewalks around its borders.

As the Mall is a formally arranged feature of the Park, it likewise offers an excellent station for statues. If a fine row of monuments existed here, alternating with the regularly spaced trunks of the overshadowing Elms, and having their pedestals partially draped in close-growing vines, as is the custom with park monuments in Paris, the effect of this long perspective would be beautiful indeed. But, unfortunately, the few monuments which have already been placed here are poor ones; to increase their number without bettering the quality would be most unfortunate; and, therefore, these sites should be preserved with especial care by the Park Commissioners, and be jealously re-

served until, from time to time, works of an exceptionally high degree of artistic merit and appropriateness may be offered to the city.

Overland in the Cayuga Country.—IV.

WITHIN two or three miles of Geneva begins the fruit region of western New York, which stretches away to Lake Ontario and Niagara Falls on the north-west, and to Chautauqua County on the south-west. All this country is not devoted to fruit-growing, but orcharding is its dominant industry, except in some extensive grain sections like the famous and superb Genesee valley. The fruit-interest is comparatively new here, although the Apple-orchards of western New York have been famous for many years. The oldest vineyards are twenty or thirty years old, but most of the Grape-interest is comparatively recent. All fruit-growing in this part of New York is flourishing, and is rapidly extending. This is especially true of grapes, plums, and, to a smaller extent, apricots. The small fruits are yearly gaining in importance, as is shown by the reports from the numerous canning factories and evaporating establishments. Besides this, the nursery-interest is the largest and most varied on the continent. All about Geneva and many other cities and villages of western New York are nursery blocks, ranging from a few square rods of Quinces or Plums or Berries in some village yard to a hundred acres cultivated by the nurseries. The little patches here and there afford a profitable use of bits of land, for the product, if carefully grown, is sure of sale to the nurseries. Much of this stock is grown upon contract for the nurserymen, who often furnish the buds, and sometimes the seed. Much of the nursery stock sold through Rochester firms is grown at Geneva. Many of the fruitmen are graduates from the nursery business, and their training has made them, as a class, the most acute fruit-growers whom I have ever known.

T. C. Maxwell & Bros. have several farms in fruit and nursery stock, and their places may be considered types of the extensive fruit-culture of this region. At this place they have 150 acres of fruit in bearing. We drove through a continuous orchard of Plums of eighty-five acres, every tree heavy with the promise of a bountiful crop. The orchard is scrupulously clean, for all the Geneva growers believe in clean and frequent culture. The tops are started four or five feet high. There are some two dozen varieties in these orchards, of which the most profitable are Reine Claude, Purple Egg, Fields (often called Early Bradshaw) and Bradshaw. Other prominent varieties are Purple Damson, Frogmore Damson, French Damson, Farley, King, Guis, Coe's Golden Drop, Copper, German Prune, Smith Prune or Diamond, Middleburgh, and Monarch, the last a very valuable, large, blue, late plum. Here are also eighteen acres of Quinces, of Orange and Rea, the former being the better. Upon another farm across the lake the Maxwells have a block of Quinces of thirty acres, and the orchard is famous among fruitmen. Here are ten acres of sour Cherries, English Morello and Montmorenci. The Montmorenci is a famous cherry in this region, coming in a little ahead of the Morello. This is the Montmorenci ordinaire; another variety, the Montmorenci Large-fruited, is an unreliable cropper, and is rarely grown in western New York. The remaining orchards contain Apples, largely Baldwins, and other common varieties.

All these orchards, of one hundred and fifty acres, are carefully sprayed for insects and fungi. A hand field force pump carried upon a tank in a wagon and Peerless nozzles are used exclusively. Plums are sprayed two or three times for the septoria or shot-hole fungus, which causes the premature falling of the foliage, but for curculio the sheets are still used. Plums are treated with the ammoniacal carbonate of copper. The knot is fought industriously. Twice during the summer every tree is carefully examined by two men, who walk upon either side of the row. This examination, together with the search which is made in winter, has thus far kept the knot in check; but all the growers in this region are apprehensive of this disease, and the new law for its extermination is being enforced with vigor. Cherries are also sprayed with the copper carbonate to combat the leaf-blight, a disease which causes the leaves to fall before the fruit matures. The best fruit-raisers recognize the fact that abundant and healthy foliage is essential to a good crop of fruit. Quinces and Apples are sprayed twice with Bordeaux mixture, about a week after the blossoms fall, and again two weeks later. This treatment is aimed at the leaf-blight on the Quince and the scab-fungus on the Apple. For both Quinces and Apples, Paris-green is mixed with the fungicide for the purpose of killing the Codlin-moth

larvæ. This is a fair sample of the attitude of our New York fruit-growers toward spraying. The practice has taken an assured place among the operations of the orchard, and I imagine that if either spraying or cultivation had to be given up for any year, most growers would discontinue the cultivation.

The Maxwells, in all their orchards, devote the land exclusively to the trees, and this is the common method; but an entirely different system may be seen upon the farms of S. D. Willard, whose methods, like the man himself, are unique. Mr. Willard has long been known as one of the most reliable and energetic of the New York nurserymen, but his legitimate fruit interests are very large and receive the greater part of his devotion. Although Mr. Willard's chief energy is devoted to Plums, concerning which he has the most exact knowledge, he grows every fruit which will succeed in New York. He is particularly fond of the English Gooseberries, Currants and Apricots. He derives intense pleasure from every tree and variety upon his plantations, but the ultimate test of every new thing is its commercial value, and I have never yet found an establishment which so happily combines the two sides of fruit-growing—the pleasure and the profit. The greatest energy is directed in securing new varieties, both domestic and foreign, and these are top-budded or top-grafted into old trees, being designated by numbered tags. Several valuable fruits have been brought to notice by Mr. Willard in this manner, prominent among which are some of the Japanese Plums, especially the Burbank, which have here been well tested for our northern country. Mr. Willard's method of fruit-growing is peculiar and may be described as a mixed intensive method. The leading fruit of the plantation is systematically planted, but the spaces between the trees are jammed full of the most puzzling assortment of fruits and other plants. His oldest fruit-plantation was originally an Apple-orchard. Between the Apples were set Plums, and as these and the smaller fruits become more profitable, with approaching maturity, the Apples are cut off. "Apples are too slow for me, and there is not enough in them," is Mr. Willard's characteristic remark. "They are profitable for larger farms and cheaper lands, but I can make more money from the more perishable fruits." So the skeleton of this unique fruit-plantation has been gradually transformed from Apples into Plums. Between the Plums in some places are Quinces and Berries, or perhaps Grapes, here and there; now a row or a few trees of Pears, mostly of the favorite Kieffer, a plantation of Blackberries with Strawberries between; a bit of English Gooseberries or Raspberries or Currants, or a few rows of nursery stock, very likely mound-layered Multiflora Roses or Magnolia Stock. Everything is crammed, jammed and tucked up, and everything is remarkably thrifty and productive. In fact, one is astonished to find such a system successful, and with most men it could not be so, but here it works to perfection. It is the only place in which I was ever really satisfied that such thick and mixed planting is successful. The secrets of success here are manure and cultivation. The land is naturally strong, and would generally be regarded as rich enough for fruit-growing, without fertilizing; but the soil turned up by the cultivator along the rows shows a liberal quantity of fine stable manure well mixed in. Pruning, spraying, bug-catching, and all the other requisites to the best orcharding, proceed upon well-considered plans. There are several of these places where Mr. Willard practices this intensive culture, or something like it, and everywhere one is struck with the enthusiasm and determination of the man. There are nurseries of large dimensions belonging to him and scattered over a wide territory. The feature of these nurseries which especially strikes the visitor, is the enormous quantity of Birches, for here, I suppose, the ornamental Birches are grown in greater quantity than at any other establishment in this country.

But a volume could easily be written upon the horticulture of Geneva. It is altogether a remarkable and productive country, and the soil and the inhabitants appear to be as fresh as they were in the days when the great wheat-fields covered these hills and plains. Here, too, is the State Experiment Station, with unrivaled facilities, in its own equipment and in the neighboring farms, for horticultural work. But we have already tarried long at Geneva, and we must turn homeward. We again round the foot of Seneca Lake, but instead of striking diagonally across the divide toward Cayuga, we skirt its shores upon the west for many miles. Here we miss the villages which we found in the outward journey, but, what is more to our liking, we are constantly coming upon orchards and vineyards and snug homes. Yet this western shore of Seneca is only partially developed horticulturally. It has great possibilities which are coming now to be appreciated. There

are isolated plantations of great extent, the most notable of which is the great Smith farm near Ovid, overlooking the lake from a most commanding bluff. In some respects this is one of the most important orchard and vineyard establishments in the lake region, particularly for the great number of apricots which are growing in orchards like plums or peaches and which are found to be a successful fruit for market. This great plantation stands like an island in a desert of indifferent old-style farms, a perennial proof of the possibilities of the soil when tilled with diligence and fertilized with thought.

Soon we turn eastward over the hills. As we rise above the lake we pass away from the orchards and vineyards and find ourselves among broad fields of hay and grain. There is little corn, and the higher we go the less corn we see. Now Seneca Lake lies far below us like a broad blue ribbon, and the patchwork hills to the westward are tilted in haze against the sky. It is an inspiring panorama, and we stop our horse often that we may look back upon it. But the immediate prospect is no longer pleasing. We are reaching the tops of the hills and we are far from any village. The land looks cold and thin. It is no longer cultivated in warm, snug fields. It is nearly all in grass, and the land has long since lost its blood and body, as the plant-food it contained was taken up by the grass and sold away in the hay. The acres of daisies, the broken fences, the staring barn-yards, the half-finished or ruined farm-houses, all show that the farmer has been made to pay the penalty of his own ignorance and indifference. He is too far from town to attend the institutes and to receive the benefits of contact with his fellow-men, and somehow he has never noticed that the farms beyond him upon either slope, where grain and corn and grass have been rotated these many years, are much better and brighter than his. He is too high up to grow corn for market, but he can do something beside raise grass, or he can sell his grass as beef or mutton or butter and have the manure for his land. But he has sold the heart of his farm to the hay-dealer years ago, and he is an object of pity now. Cold and bare and cheerless he drags out the weary years upon these Cayuga hills.

Now we pitch to the eastward into warm, fertile valleys and by cosy homes, and under their inspiration we jog on happily to Ithaca and end a pleasant four days' ride.

Cornell University.

L. H. Bailey.

Shongum.—II.

THE great thickness of the sandstone ledges of these mountains, and the natural cementing of the crevices in these reservoirs by disintegration, have preserved several small lakes amid the uplands in positions that add much to the beauty of the scenery and to the variety of the vegetation. Lake Minnewaska is nearly a triangle in shape, three-quarters of a mile long by a fifth of a mile wide, and forty feet deep in its deepest places, while the shores are everywhere bold and rocky. Its clear pure waters reflect the tint of rock and foliage, or, like a mirror, lie open to the sunshine and the sky. Along one side the walls of white stone are regular in their stratification and rise perpendicular to the height of ninety feet, with a buttress here and there supporting an overhanging slab, square cut, as if made with tools. All this is covered with leathery brown lichen, indicating great age, and testifying to the hardness of the material on which it grows. Huge heaps of rock along the margin of the lake, and running up into the few ravines that break the wall, give place for the growth of trees and shrubs. There are Pines ten inches in diameter and thirty feet high, with no apparent diet except sandstone and water; but the curious and far-reaching wisdom with which roots sometimes larger than the trunk of the tree are twisted among the stones and wedged into their crevices suggests the possession of some hidden knowledge of food by the *Pinus resinosa*. Under these, and among the debris they have made, the *Kalmia* and the pretty Mountain Holly (*Nemopanthes fascicularis*) luxuriate, clothing the feet of the giant cliff with a soft green mantle as they dip under the water.

Opposite the cliff the shore is more irregular in outline and slightly receding, so as to give place among its ledges for the most picturesque growth of trees, among which the Peperidge (*Nyssa*) is frequent, and already gay in its brilliant autumn colors. Along this edge of the lake, also, among more common Ferns, is the delicate *Osmunda regalis*. The eastern end of the lake is narrow, and here the walls break down to give an enchanting perspective, with the blue hills along the Hudson on the horizon. A similar break at one of the western corners gives a glimpse of the Catskills and the nearer mountains, which we watch with eagerness when the glory of the sunset makes a sublime picture of earth and sky.

Lake Mohonk lies to the north-east, seven miles away, and is smaller and more regular in outline. Lake Awasting, five miles to the south-west, holds about the same level with its fellows, of 1,650 feet above the tide, and is much larger and deeper. Its length is two miles, its greatest width half a mile, its greatest depth eighty feet, with the same bold, rocky shores and general formation of cliff and forest. But from this lake, and from an extensive marsh not far below its outlet, flows the large stream which, in its descent, makes the poetry of these woodland walks, and for many miles gives the voice of its music, in numberless cascades, or in its two roaring falls, to swell the grand diapason of the winds in the Pines that crown the cliffs above. The stream is a constant joy and excitement, and reconciles the dwellers here even to that horror of invalids and idle people, a rainy day.

After a rainy day I went to Awasting Fall, through a woodland path that descends sharply from Lake Minniwaska three-quarters of a mile to meet the stream. The growth just here is chiefly of Chestnut and Maple, both Red and Sugar Maple, mingled with Birch. There are no large trees, but the graceful creatures stand like young matrons with their children of different ages around them and their babies at their feet. The Sassafras is everywhere. I have great sympathy with this tree because of its love of variety. I am persuaded it would like to be a Dolly Varden, and flaunt in gay clothing, but, being devoid of all expression of such taste, it can only blush a dull red at the tips of the wet fingers it puts forth to greet us, and show a little dash of color in its petioles; and so it constantly employs itself in changing its form of garniture. No matter how small or how large it may be, did anybody ever see a branch of Sassafras where the leaves were all alike?

Interspersed among these were a few Chestnut Oaks, growing low and bushy, and higher than all rose the scattered Pine-trees. The path descending over ledges of white rock, where grow scant mosses and lichens, and along the edge of a cliff, which walls in the head of a deep valley, brought us to a point where the stream, already vexed to foam in its swift course, makes a leap of seventy-five feet to the pool below. On the further side the rocks rise to a perpendicular height of one hundred and fifty feet, and then recede, still rising, broken and covered with Pines, to a greater height. Beneath flows the stream, while on the nearer side the cliffs are curved around a deep basin that may once have been a lake. The debris of fallen rock and tree, rising gradually from the stream half-way up this cliff, makes a deep soil always moist and warm and sheltered. Here once grew great Hemlocks and Pines, but they became food for the mill below, and since then fires have often swept over these heights. Now as I stood beside the stream at this lower level I found a twilight made by tall Maples and Chestnuts, with a White Oak here and there, and abundance of Black Cherry, which might in time become valuable, and many Birches, among them *Betula papyrifera*, which I did not find on the hill above. There were thickets of Laurel now ripening its spiked berries, the Rhododendron was vigorous and tall in the black soil, and occasionally a Rhodora grew beside the path.

Reluctantly I turned from the beauty of the waterfall. When I had seen it before it was a filmy veil, falling over a projecting edge curved like a scimitar, and breaking into spray through which the morning sunshine wove prismatic colors, and a thousand broken rainbows danced over the worn gray rocks behind the waters. Now the air trembled with the roar of the mad stream, and the gorge near it was full of mist like rain, while the tormented pool dashed itself far over its usual bounds. Near it, against the cliff, huge rocks are piled, and these, green with thick mosses, nourish the Polypodium and other Ferns, while tall brakes grow between. Half-way down the cliff and wholly under its shelving edge, a Black Birch had rooted itself in the debris, and, growing luxuriantly, held in its upper branches a bird's nest, empty now and with the spray drifting over it. The ground was soft with mosses and covered with the Partridge-berry vine, the Swamp Blueberry and the Wintergreen.

In open places where the path touched the stream we saw it bathing the roots of Alder and Elder bushes, while Black-berry and Raspberry bushes caught us in passing, with an offering of fruit. In the clefts of the precipice opposite, small Pines and Hemlocks had taken root, and tiny Laurels, their leaves already ripe and red, and tufts of Columbine and Golden-rod; while the Hardhack, *Spirea tomentosa*, with its relative *S. aruncus*, grew plentifully by the margin, and nodded their white and crimson heads to each other across the amber flood speeding by with flecks of white foam.

Thus far for more than half a mile we followed our rapid

guide, until the path merged into a wood road. *Azalea viscosa* bordered our way. All along, as we had looked up through the confused stems of the thickly growing trees, we had seen evidence of former greatness in prostrate massive trunks that now only serve as food for their successors. But beautiful in decay they were, covered with moss and Lycopodium, and the dwarf Club Mosses and wonderful Lichens, often in brilliant tints of orange and curious coralline forms of fungus, red, yellow and creamy white, as if they had mistaken the depth of this basin for the bottom of the sea.

And then our steps led to the country road, and crossing it we came in a few minutes to the "high Peterskill." This outlet of our stream is at a point where one wall of the mountain runs past the other, and the current makes a sharp turn, after taking its first leap into the gorge, over the foundations of that which had hitherto restrained its course; then, gathering itself, springs across the ledges two hundred and fifty feet down the ravine; and though beyond this point it is only a succession of cascades, after a rain it becomes a cataract, with no apparent division in the raging, plunging mass that flings its foam high in the air as it descends with a volume of sound multiplied by echoes from its rocky borders.

For these still rise high above it—on the west perhaps a thousand feet from the bottom of the ravine, which is only about seventy-five feet wide. But everywhere the graceful Birch and Poplar, the Chestnut and Oak, the Maple and Sassafras, and the Pepperidge crowd among the Pines that have wedged themselves in the crevices of the rock, and the Mountain Holly, with its brilliant berries, and the Dogwood, with crimsoning leaves, in its gray escarpment of rock and the music of its rejoicing waters, a thing of beauty worth going far to see.

The remains of a substantial mill, half-way down the gorge, and near the road, tell that this wild creature was once made the servant of man's need for lumber. A still greater wrong was done by robbing it of the historic Indian name, Aioskawasting, and calling it the Peterskill. But under this latter cognomen it is known on the lower slopes of the mountain, where it pursues its course to the north-west until it joins the Roundout River.

When this region was covered with the heavy forest that sheltered the sources of springs now bare and dry, the stream had many affluents, and must have filled its whole channel, as the water-worn rocks everywhere testify. Even now, after long, heavy rains, or when snow melts in the spring, its volume is so much increased that bridges five feet above its usual level are carried away. Then the Awasting and the Peterskill falls are said to be magnificent and almost fearful in their might. After the lumbermen had sacrificed the primeval forest the land was left to recover itself, but the beneficent processes of nature have been constantly interrupted by fires that have raged everywhere, often burning deep into the soil and destroying all hope for the future. Now, except in deep basins such as I have described, the soil is poor and thin, and the green robe that covers it is more for beauty than for use. Yet even this the greed of man constantly imperils. The small farmers on the lower slopes, and the squatters hidden among the rocks, make a poor living by the harvest of Blueberries and other kindred fruit, and often have set fires to burn over large tracts because a growth of this kind follows. Those who would prevent this spoliation are obliged to use constant watchfulness, and all kinds of moral and material suasion, for the law gives them no adequate redress. The progress of civilization is shown in nothing more than in making man care for the welfare of all, above his individual good, and though the idea obtains slowly, there still are evidences that it is taking root in this neighborhood.

Minnewaska.

M. H. P.

New or Little-known Plants.

Aster sericeus.

THIS handsome little species should be in every good garden of hardy plants. The stems, which are paniculately branched above, are only a foot or two high, and are well clothed with oblong leaves, which are silky white from the soft pubescence with which they are entirely clothed. The color of the leaves and of the bracts of the floral involucre serve as an excellent background for the ray-flowers, which are large and a deep violet color, and in late autumn make this plant exceptionally beautiful and interesting.

Aster sericeus is a native of dry uplands and prairies from Minnesota and Illinois to Tennessee and Texas. In cultivation it is perfectly hardy on the Atlantic seaboard, and quickly adapts itself to new conditions and surroundings. Our illustration below is from a drawing made by Mr. Faxon of a plant in Professor Sargent's garden in Brookline, Massachusetts.



Fig. 80.—*Aster sericeus*.—See page 472.

Foreign Correspondence.

The Chiswick Garden in England.

AN interesting garden in England is the experimental ground of the Royal Horticultural Society at Chiswick, a suburb of London, and within easy reach of the great metropolis. It comprises about eleven acres and is devoted to testing the merits of fruits, vegetables and flowers sent for trial by the leading nurserymen of Eng-

land, the Continent and America. Trials are conducted each year with the greatest possible care. At the proper season the committees visit the gardens and adjudicate upon the varieties. The potatoes, for example, are lifted in their presence, so that they can ascertain other points besides the appearance and table qualities. Before the Royal Horticultural Society expended such large sums in the acquirement of the gardens at South Kensington, laid out in costly style, but never profitable, the Chiswick Gardens were much larger, and in the preface to the fourth volume of the *Transactions of the Horticultural Society*, published April, 1822, we read that "a tract of land at Chiswick, which has been recently taken of his Grace the Duke of Devonshire, under a lease, renewable for ever, at the will of the Society, appears to afford in point of soil, situation and other conveniences, everything that could have been desired." The Chiswick fêtes held in the earlier days of the Society were more fashionable than even the fêtes of the Royal Botanic Society at Regent's Park at the present day. The grounds were the centre of attraction for the élite of London, and the fêtes were graced by the Royal presence. These palmy days are over, and a few years ago it seemed to be a matter for consideration whether the Chiswick Gardens should not be given up. A strong feeling for their retention prevailed, and Mr. A. F. Barron, the superintendent, is permitted to carry on the good work that he has accomplished over a long series of years.

It is a pleasure to record, after a recent visit to the gardens, that they are gay with flowers, and the plant-houses are in excellent condition. But they are only recovering from a period of depression, and in time, as the Society sees its way to extend more liberal help to the gardens, we shall find that the horticulturist will gain even more solid information than can be gleaned at the present day. It was at Chiswick that the great Apple Congress was held which did much to place the nomenclature of this fruit upon a proper footing, and the Pear Conference took place later, while during the past three or four years conferences on flowers, fruits, shrubs, and conifers in particular, have brought together horticulturists from many parts of England.

These events have been duly recorded by Mr. Watson in his interesting letters, and, therefore, nothing further need be written concerning them.

A few of the most interesting features in the grounds at the present time may be noted. In the central walk, leading from the great vinery to the private gate of the superintendent, the most striking effect in color is gained. On one side a collection of Dahlias is now at the height of its beauty, and on a cool, moist, shady border, skirting by the side of a hedge of Box, the Tufted Pansy, as these hybrid

Violets are called in England, is thoroughly at home. The beds are filled with either one distinct variety or just enough to secure contrast in color. A collection of Tufted Pansies from such growers as Messrs. Dobbie & Co., of Rothsay, Scotland, entirely fills some of the beds. These plants are one sheet of color, varying from pure white to the profound purple of the great market kind, Archie Grant, one of the best self-colored varieties in cultivation. The flowers are of superb depth, bold, and borne with great freedom. This, with Bluebell, a variety of a paler, brighter shade, are the chief Tufted Pansies used in the border parks, where they form edgings or a groundwork to taller plants.

A fine effect is gained by a single bed of the variety *Plenus maximus* of *Helianthus multiflorus*. It is the finest of the late-blooming Sunflowers, the stems rising five or six feet in height, the leafage abundant, and the bold yellow flowers of great depth and substance. The best method of planting is to permit it to stand alone, with nothing for contrast, although, of course, careful use must be made of such bold, not to say garish, plants. We often crowd too much yellow into our gardens in the autumn.

At Chiswick, Messrs. Cannell & Sons, of Swanley, who grow the Tuberous Begonia largely for bedding, have several varieties for trial, and the flowers, especially of the crimson kinds, are intensely brilliant. Messrs. Vilmorin & Cie., Paris, and Messrs. Sutton & Sons, of Reading, are represented by varieties of Begonia *semperflorens*. They are delightful bedders, dwarf, compact and smothered with bloom. The best of these is Vernon's variety (*rubrum*), which appears to be the same as the Crimson Gem of Messrs. Sutton & Sons. The plant is about nine inches or a foot in height, the leaves deep green, in which there is a suspicion of chocolate, and the flowers are rich crimson, making a fine contrast. A bed of it would be very effective, and so would an edging of it if it bordered a mass of plants which properly harmonized or contrasted with the distinct quality of its foliage and flowers. Princess Beatrice is a little gem; the leaves are small, and the flowers pink and white, so profusely borne as to hide the foliage. We have few more useful edging-plants, and, like the ordinary tuberous types, it succeeds well even in unfavorable summers. Afterglow is a good kind with crimson flowers. A variety of *B. erecta*, from Vilmorin, named Nain Rouge Foin, is remarkable for its compactness and splendid crimson flowers that glow like fire. A very interesting group from the same Parisian firm comprises a number of double varieties with small flowers, the centre like a little rosette set in broad segments. Their freedom in flowering is extraordinary.

Early this year a note appeared about Fuchsia Dunrobin Bedder in GARDEN AND FOREST. Its behavior this year justifies all that was said in its praise. It is a charming dwarf hybrid, very free, and two beds of it here are not the least interesting of the various arrangements.

One of the principal flowers this year at Chiswick is the herbaceous Phlox, and collections have come from such well-known growers as Messrs. Paul & Son, of Cheshunt; Monsieur Lemoine, of France, and Mr. Forbes, of Hawick. It is worth while to name a few of the best, these having an excellent habit, dwarf, compact and bushy, and bold spikes of finely formed flowers of decided colors. A small revolution is taking place in regard to the perennial Phlox. Little is now seen of the tall, ungainly, scraggy types once so common, and, although there is no merit in mere dwarfness, the flower does not suffer from being shorn of much of its height. The case is different with the *Antirrhinum*, and the present practice of dwarfing it deprives the plant of its natural gracefulness and charm. I will give the names of a few of the best varieties that now provide the gayest masses of color: Iris, mauve-purple, dwarf; Henri Murger, a bold large flower, white with crimson eye; Eugene Schott, pink, white centre, the plant but a few inches high; Monsieur Henri Jacotot, white, crimson cen-

tre; Faure, very dwarf and compact, the leaves of a deep green color, and the flower large, white, with pink eye; Le Naine Blanche, white, yellow eye; Eugene Dauganvilliers, pinkish; Boule de Feu, brilliant crimson, remarkably effective; Jeanne d'Arc, a very beautiful white variety, not growing more than about two and a half feet in height; La Ville de l'Air, white, crimson eye; Bayard, purple; Pluton, crimson; Croix de Sud, white, with purplish rose centre; Jenny Greive, splendid truss, the flowers white, with a purple-rose centre; Delicata, white, rose-purple eye; Eclairer, white, with centre of similar shade; William Robinson, salmon-rose; Hain Bébé, purple-rose, very dwarf; Neptune, almost white, the leaves very dark green; Masseuet, fine truss, rose, the centre deep crimson; Longchamps, white, purple-lilac centre; Paul Bert, lilac-purple, shaded with white; Pluto, crimson-purple, fine truss, the leafage very dark green; Avalanche, white and flambeau scarlet. Many of these have been given awards by the Royal Horticultural Society, and, as will be seen by the names, are mostly of French origin.

Beds of Tea Roses, the glorious Japanese Anemone in variety, very charming the white against the rose, and African Marigolds will interest the visitor. The French and African Marigolds are placed in a narrow border, skirting the fine old wall that divides the splendidly kept lawn facing the old council room from the plant-house. And when one sees this type of Marigold, after being allowed to develop its beautiful leafage and fine bold flowers, one is compelled to contrast its appearance here with its appearance on exhibition boards. Like the Aster, the Hollyhock and other things one could name, the blooms are often cut with a short stem and are stuck on the boards without a single leaf. Fortunately this barbarous practice is passing away. One of the most pleasing beds we have seen this season was composed of the variety Lemon Queen, the flowers of a soft shade of yellow and large, in the centre, with an outer ring of a deep orange color.

Zinnias give their share of color, and the yellow flowers of a bed of *Cassia corymbosa* show well against the abundant green leafage. The *Bouvardias Humboldti* and Alfred Neuner, planted out when all fear of frost is over, bloom profusely throughout the summer. The flowers of *Humboldti* are white, sweetly scented, and those of the other kind white and perfectly double, like a little rosette. *Hedychium Gardnerianum*, with its spikes of bright yellow and fragrant flowers and rich musa-like leaves, is an excellent summer plant and gives an attractive variety. The use of such garden-plants as we have mentioned is a grateful relief from the round of Pelargoniums and carpet-plants year after year, and furnish pleasant pictures from the time the spring bulbs are over until the Michaelmas Daisies have faded. The collection of Sunflowers, which is large and comprises the best kinds, ought not to be passed without notice.

The rockery is not one of the least important of the many fine rock-gardens that abound in England, and its interest will be increased by the handsome gift from the Royal Gardens, Kew, of two hundred plants of the rarer kinds. But it cannot, of course, compare with such picturesque rockeries as that of Kew, a veritable treasure-house of rare things, splendidly grown, or of the famous rock-garden of the Messrs. Backhouse at York. Space fails to make mention of the collection of Figs grown in the house once given up to Palms and foliage plants, and of the vinery, one of the most extensive in England. In spring Chiswick is a garden of blossoms from the numerous Apple and Pear trees, of which there is an extensive collection. Altogether, Chiswick, though small, surrounded by residences and shorn of much of its former glory, is a charming spot, beautiful for its flowers and of the greatest interest to the practical horticulturist from its careful trials of fruits and vegetables and garden-plants, the most common kinds of which are not neglected.

London.

V. C.

Cultural Department.

The Cultivation of Tuberous Begonias.

AT the Begonia Conference held at Chiswick on the 23d of August last the senior partner of the firm of John Laing & Sons read a paper, of which we have before spoken. The very interesting history of Tuberous Be-

notes on the more practical points of propagating and cultivating these plants, and we therefore give in a condensed form the last portion of his admirable paper, a copy of which has been kindly furnished us.

There are at least four ways of propagating Tuberous Begonias—by seeds, cuttings, leaf-cuttings and division of the tuber. The first two are the most practicable and profitable.



Fig. 81.—The Islay, *Prunus ilicifolia*—See page 466.

gonias from the time of the introduction of *Begonia Boliviana*, the list of the various species whose blood in turn has been added to the mingled strains to produce the present remarkable race; the care which has been exercised to improve the size, shape, texture and color of the flower and habit of the plant, have all been spoken of before. Our readers will be glad to hear some of Mr. Laing's

Increase by cuttings is essential only in the case of choice standard kinds which are to be kept true to name. These are used chiefly for pot-culture, and as the most improved or advanced types of the race from which the finest strain of seeds is derived. Young shoots from near the base of the plants make the best cuttings, and they may be inserted any time during the growing season, but the earlier the better they will root and the better tubers they will form. A few of the young

growths that arise from the tubers in spring may be taken; but the fact must not be overlooked that to take the same liberties with them as with Dahlias would be ruinous to a good display of bloom on the old plants for a season. The cuttings should be inserted singly against the side of thumb-pots in a compost consisting of loam, leaf-soil and sand, in about equal proportions, and plunged in cocoanut-fibre in the bed of a propagating pit or frame, and shaded till they have emitted roots, and may be grown on if required for late blooming. The young plants should be kept in the cutting-pots till the following spring, and this is the more essential in the case of late-struck cuttings, but, where practicable, the latter should be potted and kept growing.

Propagation by seeds is at once the most legitimate, speedy, profitable and certain mode of increasing this class of Begonias, either for pot-culture or summer bedding. There will always be a certain amount of speculation with regard to the color, habit and character of the seedlings the first year, but, if derived from a good strain, they seldom fail to give satisfaction, and may be assorted for future work as they come into bloom. They may be sown at almost any time of the year, according to the convenience and requirements of an establishment. For my purpose I find the third or fourth week in January is the most suitable. Those who have a sufficient command of fire heat will find it advantageous to sow early in the year, as the seedlings are less liable to damp off than when they are germinated in May, June or July.

The seeds are sown in square, round or oblong pans or shallow wooden boxes, in a compost of light porous material, consisting of flaky leaf-soil, a little loam and plenty of sharp sand. This is mixed, and used in a rough state, with some finely sifted material on the top to form a smooth and level seed-bed, which is pressed firm, watered, or more suitably dipped, and then the diminutive seeds carefully sown. The pans or boxes are placed in a temperature of sixty-five to seventy degrees, with more bottom-heat. The seedlings are pricked out into other boxes from time to time, as soon as they can be handled, with a finely pointed piece of wood divided at the point to lift the seedlings. As they germinate very unequally, and in succession, the work of pricking them off employs some men and boys for weeks together. When the seedlings begin to get crowded they are transplanted into other boxes at a greater distance apart. By the middle of May they are ready for hardening off. During the first three weeks of June a staff of men and boys were constantly employed in planting those now in the open ground. By this time a large proportion of them have commenced to bloom, and several thousand of the most promising doubles, some of them gems, are transferred to 48-size pots and placed in new houses specially built for their reception.

The ground in which the seedlings are planted out is heavily manured and roughly dug up to the action of frost in autumn. Old tubers intended for bedding out should be started about the last week in March or the beginning of April; small-sized pots will be quite sufficient for them. A warm and showery month of June, and rather drier weather in July and August, are most favorable to Begonias in the open ground.

For pot plants one-year-old tubers are the most generally useful; but those of two or three years' growth make the finest specimen plants. When four years old they degenerate, some sooner, some later; hence the necessity of raising young plants to keep up the standard of perfection. The first batch of plants may be started about the end of January or the beginning of February, and they will flower in April or May, according to the amount of sunshine they enjoy or the artificial heat used. Successional batches of tubers may be put into heat during March or April to flower in June or July, and be it observed, that the more slowly they are brought forward, the more sturdy and durable will they be. Put them singly in small pots proportionately to the size of the tubers, in a compost consisting of equal parts of fibrous loam, leaf-soil, and sand in a rough or lumpy condition. Press the soil rather firmly, if short growth and a long season are desired, merely covering the top of the tuber. Stand the pots on a bed of cocoanut-fibre or plunge them into it, and keep the temperature of the house at sixty-five to seventy degrees. Should the soil be dry at potting time, give a watering; but after that it should be applied with discretion till the plants begin to grow freely. Tubers that have been wintered in pots may be put into heat, watered a little, and afterward damped down with the syringe till they start into growth, and then repotted into suitably smaller sizes. Light is of great importance in the early months of the year, and it is all-important that the plants should be kept as near the glass as possible, after they have started into growth, to encourage a short-jointed and sturdy growth.

Repot the plants before they become root-bound, and as the season advances, and the temperature outside becomes milder, gradually give more and more ventilation, for upon a cool and airy atmosphere a great deal of success in Begonia-culture depends. Low span-roofed houses give most satisfaction. The soft and watery tissue of Begonias soon responds to favorable or unfavorable conditions; therefore let them have a house to themselves where possible, and no make-shift permitted. The smaller plants may be grown on the side shelves on ashes or cocoanut-fibre, while the larger and taller specimens may be elevated on shelving, staging tier above tier in the centre of the house and near the glass. A free play of air among the foliage keeps it fresh and healthy, and a dry atmosphere prevents the spotting of either flowers or foliage, as the weather gets warm about April and onwards. More or less shading during the heat of the day will be required after that month. When the plants have finished flowering or become useless for decorative purposes, stand them out-of-doors, in a sunny position, but sheltered from wind, and keep them watered till the leaves show signs of decay, after which water may gradually be withheld till the tubers ripen and the stems drop away. Remove them indoors on the approach of frosty nights.

Tuberous Begonias as Bedding-plants.

THESE new-comers, which have so greatly pleased us the past three years, have been disappointing this season, though not from any fault of their own, or not from any cause that will impair their usefulness in the future. The trouble is that their true character has not been recognized. The enthusiastic grower has claimed too much for them when he asserts that they can be grown in the same manner as the *Gladiolus*, and that the tubers can be kept dry and planted out when and where wanted just as the *Gladiolus* can. This mistake has cost many amateurs a good many plants, and has made them cautious about buying, and in some cases has quite discouraged them. This should not be, as the plant is all that has been claimed for it, and more.

The past year, it is true, has been a hard one for the Tuberous Begonia, as it has been for almost every other plant. Heat and moisture have not been proportionate. But the present season has only proved to us that this plant is not injured by hot weather, as is shown by the display made when it is grown on a large scale. Although the losses in the nursery have been considerable, they have been of great value in the line of practical knowledge. The lesson learned is, that it must be treated as a bedding-plant, and as such must have a good start in the greenhouse, and not transferred to the border until in a thrifty, growing state. The plants should be from four to six inches high, and proportionately strong when set out; then, even in a season like the present, they have no rivals. Those put out in Mr. Griffin's nursery this season, when well started, are marvels of beauty and healthfulness; they do not show in the least the effects of a drought or of heat. Those that were too young, and but little started, have suffered badly. The same is shown plainly in many other places, proving most conclusively that this plant has come to stay, and that it far surpasses anything we have in the way of low-growing bedding-plants, and, further, that to grow it successfully, plants, strong and well grown, must be put out, rather than dry tubers.

Floral Park, N. Y.

C. L. Allen.

Planting Perennials.

MANY persons are now inquiring as to the best time to plant hardy herbaceous plants, and as the season is here when the operation may safely be carried out a few notes on the general subject will be timely. It has been stated that all hardy plants may be planted in spring, and the inference is that that is the best season to transplant. This is true with regard to shallow-rooting plants or those which are of small size when fully developed, but the trouble is, that in all gardens, large or small, the arrival of spring inevitably brings with it a rush of work peculiar to the season, and when this is completed many of the earliest border-plants are already well advanced, perhaps more so elsewhere than in our own gardens, and this adds to the risk of procuring them in spring. Last fall we found that Elm-roots had complete possession of a large border here, and at this season the whole of the plants were lifted, the border dug two feet deep and enriched, and the plants moved over as the work proceeded, and not a plant was lost. The season was a favorable one; the roots took hold at once, and when frost came the plants were well established. This spring we had six weeks of dry weather without a shower

after snow left, and had the work been done then many losses and a poor display would have been the result. It is a safe rule, therefore, not to put off until spring what may be done in fall.

Where alterations are contemplated in existing arrangements this is the best time to make a survey while the plants are in character. Strong-growing plants will be aggressive and exclude weaker ones, and attention to such matters should be given every year. Some plants, too, will die out from various causes. Seasons differ. A wet year suits some plants to the injury of others, and vice versa, and if this should chance to be an unfavorable time to make changes and supply losses, take notes of the situation so that the necessary changes can be made before growth commences next year. Up to this time we have had no frost, but as soon as the garden has been seared by it the plants that are herbaceous will be cut down, divided if necessary and replanted and the whole borders treated to a liberal top-dressing of well-decayed compost, which will remain on in spring and not be dug in. The annual digging and cleaning of hardy flower-beds requires skilled labor of the best kind to avoid injury to the dormant plants. Therefore the borders are left alone after the top-dressing in fall, and they look, to the well-informed, snug and comfortable.

The operation of planting means more than making a hole in the ground and thrusting the roots into it. Plants hold out in dry weather by means of their deep roots, and the proper way to plant is to take a spade and loosen the soil thoroughly over as large a space as the foliage should cover when fully developed. We should remember that the parts of a plant above and below the soil are beautifully balanced by nature, and if the one cannot develop the other will not.

There are always in the border plants that are more or less tender and which require lifting to protect them in winter. These should now be taken up and the roots placed in soil in a cool cellar. Plants keep better in such a place than in a frame outdoors. *Tritonias* (*Kniphofias*), *Montbretias*, *Arundo donax*, *Pampas Grass*, *Eulalias*, *Helianthus multiflorus*, *Melanthus major*, *Conoclinium cœlestinum*, *Hibiscus coccineus*, and possibly the Japan *Anemones*, which are sometimes winter-killed with us, are better for this treatment. This lifting of plants is not altogether an unmixed evil, for it gives an opportunity to have fresh combinations each season, and in this way monotony is avoided. *Pennisetum longistylum*, a most elegant Grass, is now at its best. A recent writer in GARDEN AND FOREST spoke of it as an annual; it is as much a perennial as the *Eulalias* or *Arundo*, but requires lifting in fall. Our clumps were stored in the cellar last winter and are much larger than seedlings would be.

It remains now to note what not to plant at this season. For the most part all prostrate plants should be set out in spring, such as *Gypsophila repens*, *Veronica repens*, *Arenarias*, *Arabis*, *Sedums*, varieties of *Phlox subulata*, *Myosotis*, dwarf *Silenes*, *Lychnis* and *Campanulas*, all ornamental grasses, *Hollyhocks*, *Anemone Japonica* and *Hellebores* of all kinds. Prostrate plants do not take hold so readily in fall as deeper-rooting kinds, and they cannot be mulched so safely to prevent heaving by frost when they are planted late and not protected. All plants of doubtful hardiness should be set out in spring; all of the above-named list belong to one of these sections. By fall planting I do not mean November planting, but planting as early as possible now, before the natural warmth of the soil is exhausted. It takes some weeks to cool the soil, and plants take hold at this season and start away next year as though there had been no check. Hardy Lilies should in all cases be planted in fall, but the new bulbs from Japan do not arrive until the ground is frozen up, and they have to be kept over till spring in a cool place, but where transplanting has to be done in one's own garden, the time to do it is as soon as the stalks turn yellow, as root-growth at the base of the bulbs commences with the end of the flowering season, to fortify the bulb as it were in its effort to produce a flower-shoot. This flower-stalk, when once started, is self-supporting by means of the stem-roots.

South Lancaster, Mass.

E. O. Orpet.

Water-lilies.

SOME specimens of *Nymphæas* sent by Mr. J. Brydon from the gardens of Miss Simpkins, of Yarmouthport, Massachusetts, are marvelous examples of the best cultivation and most vigorous growth. A flower of *N. Zanzibarensis* fully a foot across, highly colored, and on a stem about an inch in diameter, probably represents this variety in its very best form. There was also a fine specimen of the very dark purple variety, which is somewhat rare, as it seldom reproduces this rich coloring from seeds. The odor of *N. Zanzibarensis* is one of its special charms, being very distinct, deli-

cate and pleasing. Only second in size to the *N. Zanzibarensis* was a flower of the *N. gigantea*, the rare Australian species, with which few cultivators have succeeded in the open. This is a *Nymphæa* with petals less blunt than those of the *Stellata* type, and of less firm texture. The flowers are blue, shading to white toward the centre, which is crowded with a mass of thread-like golden stamens. This species is very distinct from the other tender Water-lilies, not only in its coloring and stamens, but also in its less formal character. When well established it is one of the most prolific of bloomers. The stems of these *Nymphæas* were about one foot and a half to two feet long, and as straight as canes. In a note with the flowers, Mr. Brydon says: "I claim that the finest Lilies are those grown in deep water; by deep water meaning two feet or two feet and three inches. Perhaps where it is not possible to artificially heat the pond, shallow water would be preferable, but it will be at the expense of the flowers every time. I contend that the buds of the tropicals should not show above the water more than two or three days before they open. In shallow water they are above water long before they are half-developed. I like to see them come straight up from the bottom and flower shortly after they appear above the surface. The finest flowers of *N. odorata* I ever saw were grown in four feet of water, and it seems that if this variety will do so well under such a depth of water the tropical kinds should stand much more than is commonly given them, as they are mostly strong-growing."

I have been a consistent advocate of shallow planting, but it gives me pleasure to call attention to the apparently contradictory views of so able a cultivator as Mr. Brydon, who is, no doubt, correct under the conditions given. One can scarcely cultivate plants very long before making the discovery that when growing in the open, exposed to all the contingencies of such exposure, success is at the best rather uncertain. Hence it is customary, when crops are important or especially well-grown flowers are desired, to resort to shelters or aids of some kinds. In this view, no doubt, heated tanks are very serviceable and important aids to the cultivation of *Nymphæas*. And in them, with the temperature of the water, which is such a vital matter, under control, no doubt, in an average season, the best results can be secured, and deep plantings can be made as seems necessary for the best results. But heated tanks are not always available, and my notes of my practice of shallow planting have been made in the hope of interesting the owners of small gardens in aquatics. Some of us are quite satisfied with modest results, being debarred often by expense, and sometimes by other considerations, from securing the very best results attainable. In such cases, in this latitude, with its changeable weather, not always with reliable warmth, shallow planting of *Nymphæas* is safe and satisfactory practice, as the plants are in a position to respond promptly to the quickening power of the sun.

Elizabeth, N. J.

J. N. Gerard.

Decay of Quince Fruit.

THERE is a destructive form of Quince decay about which the growers of Quinces are much exercised. The fruit is the object of attack, and in nearly all cases the rot begins at the blossom end. It is a dry decay and the affected portion turns a light brown, followed soon by multitudes of small pimples slightly darker than the surrounding brown. The decay penetrates to the core and ultimately involves the whole fruit.

In one orchard of a hundred trees recently visited, nearly half of the fruit, otherwise large and fine, was found with a rot-spot ranging from a mere speck at the blossom end to entire decay. It may be that some substance applied to the blossom end will assist in preserving the fruit from attack. It is possible that the tender parts of the flower may be the ones most susceptible, and by removing these when the quince is small, the enemy may be successfully resisted. Thus the calyx lobes might be removed, as they generally become brown and, lying upon the surface of the fruit, probably assist in giving the rot-fungus a foothold. It would be practicable to remove the useless parts of the blossom end of the fruit, as quinces are within easy reach of the ground, and usually only a few trees are grown. This treatment would be in addition to the spraying of Quince-trees to ward off common leaf-blight, an entirely different fungus. The enemy of the fruit is *Sphæropsis Cydoniæ*. It also preys upon the foliage and was, in fact, described from specimens from leaves. It has not, this season, been found upon the foliage of the trees.

The decaying fruit is worthless and should be picked off and burned. If left upon the trees or ground, the fungus will mature a vast number of its oval brown spores and menace the quince crop next year.

Rutgers College.

Byron D. Halsted.

Correspondence.

Frozen Chrysanthemums at the Royal Aquarium.

To the Editor of GARDEN AND FOREST:

Sir,—On the first page of this morning's *Standard*, sandwiched between an announcement of fireworks at the Crystal Palace and another of Buffalo Bill's Wild West, the following paragraph caught my eye:

"Royal Aquarium: The National Chrysanthemum Society's Grand Show of early Chrysanthemums, Dahlias and Gladioli will be unusually interesting, showing new varieties brought from the antipodes to this country in frozen blocks of ice."

A few hours later I was paying my shilling at the entrance turnstile. The Royal Aquarium is a long brick building with a glass roof, reminding one in its architecture of a good many railway-stations. It stands in a back street, within a stone's-throw of Westminster Abbey, fortunately where it cannot mar that stately of London's groups of towers, which the Houses of Parliament and St. Margaret's join with the Abbey to compose. The last time I remember passing it, the building was liberally bespotted with huge posters announcing the presence within of Niagara with real water, and an English lady had told me that she thought it "very kind of the Americans to send the falls over." But now the vast inner hall was filled with a bewildering choice of attractions. Just within the door was a shooting-gallery; beyond, a loud-voiced phrenologist was assuring his audience that the "subject" under consideration "ad such a 'ead that 'e'd make a capital heditor." Further still, there was a small stage, its lowered curtain covered with what was perhaps an attempt to picture the mythical Snake-plant of Central America.

Rounding the empty dress-circle of this expectant theatre the flower-exhibit appeared, admirably arranged on parallel tables, set well apart, and culminating at the further end with huge pyramids of Chrysanthemum-plants and the frozen blossoms from New Zealand. Passing up to these, the chief attraction, one was detained by the superb specimens of the Madame Desgranges Chrysanthemum. The perfection of these great, soft, snowy heads is indescribable, and there was a sport of this variety, to which a medal had been awarded, where a delicate pink tip appeared on the three outer rows of petals. It rivaled the original in beauty, but no name has yet been given it. The professional decorator may be earnestly recommended to place side by side, exactly as they were to be found here, Mrs. Burrell and the Incognita, for theirs are the peculiar shades of yellow and pink which make a charming combination. There were, upon the whole, few startling novelties to note; the efforts which the gardeners have been making in the line of mauve and purple tints have not as yet been really successful. The Louis Boehmer, whose hairy pink florets were first seen in America, has sprung into favor here, and there were some splendid specimens on view, maintaining the reputation of the variety for hardy growth and free bloom. The color, too, is superb, a rich, deep, almost oriental, pink. One gardener at my elbow declared that it had darkened since its arrival in England.—[This "rich, deep color" is not the strong point of this variety, as it has been seen in America.—ED.]

All this, however, is in passing to the great attraction, which proved curious enough. The blooming-time of Chrysanthemums in New Zealand is in our spring, and last April eight flawless blooms of six distinct varieties had been cut, plunged each in a zinc cylinder filled with water and frozen solid. These cylinders were in turn packed and frozen in a zinc tank and thus shipped to London, where they had been waiting a month for this exhibition. When the various receptacles were opened and sufficiently thawed to make it possible to discern the blossoms lying imbedded in their cakes of ice they were found to be wonderfully well preserved. Save for a little discoloration at the edges, as from the nip of sudden frost, their tints were as fresh as any there—the livid pink of the Zealandi, the lemon-yellow Tarawera and the white, hairy Rimutaka. Mr. John Easland, of Wellington, New Zealand, who conceived this application of the freezing process, received from the committee a medal and certificates galore, but probably the furnishing of Covent Garden Flower Market will not become a large branch of New Zealand trade. It is the botanical lecturer or other specialist who is likely to seize on the idea and make infinite use of it. The great advantage of being able to preserve a given specimen indefinitely and produce it at an hour's notice must have occurred to every one who saw how successful was the experiment tested yesterday at the Royal Aquarium.—[Flowers in blocks of ice were seen at a New York exhibition some years ago, but they made no sensation.—ED.]

I longed to show the English florists, by the same means, what our roadside Asters were like at their best. Golden-rods they have learned to grow fairly well here, though not as perfectly as in Belgium, and one sees more of them every year, while their Firefly Lobelia (*L. flagrans*) seems at first glance the very Cardinal Flower of our brooksides, only a little enlarged and improved; but the white and mauve Asters, which they have transplanted from our New England lanes and display among their hardy flowers, make but a pitiful show.

The Dahlias exhibited were almost better than the Chrysanthemums—especially the loose, open Cactus Dahlias, which were shown in tints of astonishing depth and splendor. It seems a pity that prizes should still be offered for the huge double Dahlias and that florists should go on wasting their time in developing them, for the more they are developed the stiffer and more hideous they become.

The single Dahlia, on the other hand, is one of the most beautiful of flowers, as well as one of the most effective for decoration, especially adapted, as the German gardeners have discovered, to parks and lawns, while a bed of them at the garden's end will give light and color till the nipping frost. And for this purpose the old varieties, with their smooth tints, are better than the modern bicolored flowers, beautiful as many of these are in themselves.

London.

Louise Dodge.

[Double Dahlias and Camellias are stiff and formal, but with their rich colors and exquisite texture they still find admirers. Even among those who prefer single flowers, there are few who find them hideous.—ED.]

Cannas at Bay Ridge, New York.

To the Editor of GARDEN AND FOREST:

Sir,—For the study of plants in all their phases it is often instructive, and usually interesting, to seek them where growing in broad masses or in large quantities. As seen in this way one gains a more correct idea, in some respects, of their peculiarities, which are accented on a large scale. In this way the true nature of a variety can be more readily determined than by the observation of one or a score of plants. Curiosity as to the popular Crozy's Cannas led me a few days ago to the celebrated nursery of Mr. James Dean at Bay Ridge, Long Island. Mr. Dean early appreciated the value of these plants, and is growing them very largely. He has a full selection of varieties, but Madame Crozy and Star of '91 are grown in a very large way. Two plots of these, each containing several thousand plants, were a brilliant sight on a bright September afternoon, and their distinctive qualities were well emphasized. Madame Crozy as grown here averaged about five feet high, while in the adjoining plot of Star of '91 the plants were flowering uniformly at about three feet high. The foliage of the former was decidedly the most satisfactory, and so are the flowers, which are broader in petal, more compact and of a clearer, pleasanter tone of red, to which the tint of rich yellow on the margin contributed an added charm. The difference in coloring was very much more marked in some specimens which had been grown under glass. Here they both show a purity of color and a massiveness of petal far superior to those in the plantation. There was also in the same house a selection of yellow-flowering seedling plants of Mr. Dean's growing which show a surprising advance over any previous introductions of this color.

My main errand to Bay Ridge, however, was to inspect a large bed of seedlings from Madame Crozy, which are especially interesting just now. Mr. C. L. Allen, in the *American Agriculturist* for September, argues that Madame Crozy is a true species, introduced about 1820 as *Canna aurea vittata*, and later known as *C. limbata*. This claim seems to be founded on a colored plate in Loddiges' Botanical Cabinet, London, 1820, and an observation that "a large number of seedlings from Madame Crozy had last winter come absolutely true to the type, both as regards habit of growth of the plant and to the color and markings of the flowers."

Mr. Dean's results with seedlings from Madame Crozy do not confirm this species theory, as only a small proportion, perhaps five in a hundred, could be classed as true Madame Crozy; a smaller percentage were yellow, some almost pure-colored, others with different red markings, while the large proportion were of various shades of red, with narrower petals than the type, and of generally less value, although the broad margin of yellow on certain individuals produced a striking effect.

Mr. Dean is a leading trade-grower of Azaleas, Cytisuses, Lilies, Palms, etc., and has been especially noted for his suc-

cess in providing Easter flowers and plants of the highest class. One lot of 20,000 potted Bermuda Lilies was an indication of the quantity in which plants are grown here.

Elizabeth, N. J.

J. N. Gerard.

Recent Publications.

Something more than a year ago we published a condensed account of some experiments which Professor Bailey had made, to ascertain the effect of electric light upon plants grown in glass houses. Lettuce appeared to be greatly assisted by the light, and some ornamental plants produced earlier and brighter flowers under its influence, while some plants were affected injuriously. In these first experiments, the arc lamp hung inside of the house, and it was found that when the arc was screened by an opal globe or a pane of window glass, better results were obtained. This suggested the inquiries, (1) whether the glass roof itself would not furnish an appropriate screen, so that the light could be hung above it, and (2) if this were true, how much glass could one light profitably cover?

Without explaining the methods of screening the check plants, it is enough to say that an electric street-lamp was suspended over a greenhouse, and Bulletin 42 of the Cornell University Experiment Station contains a record of its effects upon a few common plants.

The benefit to Lettuce was quite as apparent this year as it was last, so that there can be no doubt as to the advantage of the electric light, in forcing it. Indeed, Mr. W. W. Rawson, of Arlington, near Boston, uses electric lights, which are run all night for the commercial forcing of Lettuce. Mr. Rawson estimates that he secures a gain of five days in a crop of Lettuce, by using this light, and as he grows three crops during the winter the total gain is two weeks of time. The gain from one crop is estimated as sufficient to pay the cost of running the lights all winter, and the effect of a 2,000-candle power lamp is marked at a distance of one hundred feet.

At the Cornell Station light was started on the 19th of October above some Boston Market Lettuce, four weeks old, and some seedling plants of Landreth's Forcing Lettuce, which were just beginning to show above the soil. The lamp seldom burned after eleven o'clock and often ran but an hour or two, and on moonlight nights it was not used at all. The house was exposed to sunlight during the day, in addition to this small and varying supply of electric light. A house which was lighted by the sun, but received no light at night, was used as a check. A clear glass globe surrounded the lamp, so that the light passed through two panes of glass, that is, the globe and the roof, before it reached the plants. In a single week after the light was started, the plants of Boston Market Lettuce began to excel those in the unlighted house, and when forty hours of electric light had been expended on them they were perceptibly ahead of the others. The plants directly under the light and from seven to ten feet from the arc were the earliest to show their superiority. On the first of November the lighted plants were one-fourth larger than the other, and showed a marked tendency to turn toward the light. The plants even in the farther extremity of the lighted compartment gained steadily throughout the experiment and were ready for market a week or ten days before those in the unlighted house, while in quality the Lettuce was indistinguishable from that grown under ordinary conditions.

Small plants of Landreth's Forcing Lettuce, which stood where they had been sown, behaved differently from the transplanted Lettuce. For the first week they were stunted, notwithstanding the fact that they were farther from the lamp than the Boston Market Lettuce plants which did so well from the outset. After some days of lingering, when the plants began to acquire three or four leaves, they rapidly recuperated and finally overtook their companions in the unlighted house, but they never showed the superiority which the transplanted ones exhibited. Professor Bailey does not attempt to give the reason for this behavior, although he had observed it before, and other experimenters have reported similar results. He considers it sufficient for his present purpose to say that it appears to be better to sow Lettuce under common conditions and then transplant the seedlings under the light after they are well established.

The extremity of the light compartment was forty feet away from the lamp and the roof is low, so that much of the light was reflected from it, and yet at this distance, where there was nothing but diffused light, the plants were much better than in the unlighted house. The experiment was repeated with second and third crops of Lettuce and with several varieties with similar results. On one bench Radishes had been planted

among the Lettuce and the interception of the light by the Radish-leaves had a marked effect on the Lettuce-plants which stood behind them, that is, these shaded plants were much smaller than those fully exposed to the light. When the Radishes were removed the shadows of the Radish-leaves could be traced on the Lettuce, and the same result was seen where the shadow of a rafter lay across the plants.

In the earlier experiments Radishes under the naked light were uniformly injured, and when the light was protected by an opal globe injury was still apparent, although it was decreased, that is, the tubers lost only from one to five per cent. in weight, while the weight of the leaves was increased. This year, under light which was strained through both a globe and a glass roof, there was an increase both in the tubers and in the tops. The best results were obtained from the sash directly under the light, where the tubers were more and larger and the tops were less. In no cases, however, have Radishes been sufficiently benefited to pay for the cost of the light.

Early Egyptian Beets were sown in the lighted and unlighted houses, and a month later, after 160 hours of electric light, the Beets in the lighted compartment were one-third larger than the others. Five months after sowing it was found that fifty-seven per cent. of the plants gave marketable tubers against only thirty-three per cent. of those in the dark house, and the total average weight of the plants in the light was about one-half an ounce greater than the weight of those in the dark house. The test of Beets, however, was not a decisive one, because the plants in the dark house received more bottom-heat than the others.

Last year, under the naked light, Spinach ran directly to seed, while plants in the unlighted beds made good edible leaves. In the present experiment, a month after the light had been shining an average of five hours a night, all the Spinach in the lighted house was ten to fifteen per cent. larger than in the unlighted beds, and there seemed to be no greater disposition to run to seed in the one case than in the other. This advantage was maintained throughout the experiment. The result was unexpected since in the first experiment this crop was very much injured by the light. This test seems to indicate that two panes of glass between the light and the plants have a remarkable influence.

Of Cauliflower it is sufficient to say that under the light they tended to grow taller than in ordinary conditions, but they made fewer and smaller heads.

One hundred Violets were set in beds a few days before the light was started, twelve to sixteen feet from the lamp. Fifty plants were covered every night with a black enameled cloth box, while provision was made for giving them ventilation, and fifty others received the light. In three weeks after the light was started the exposed plants began to bloom, while no buds could be found on the darkened bed. It was not until five weeks after the starting of the light that a flower appeared on the darkened plants, while the others continued to bloom. Twenty-five strong plants of the Daisy (*Bellis perennis*) were placed fifteen to twenty feet from the lamp, where the light was rather weak. Twenty-five others were placed in an unlighted house. In the first lot, flowers appeared four weeks after starting the light, and for a month or six weeks thereafter these plants bloomed more profusely. At that time the dark-house plants began to surpass the others in the number and size of their flowers and the vigor of the plants. In other words, the lighted plants bloomed earlier, and never made such a stocky growth, and soon exhausted themselves. It is possible that they might have endured longer if they had been established in beds for a longer time before the light was put upon them.

Most interesting were the observations as to the time when plants make their growth. It has been held that plants grow chiefly at night, when they use the material which they have manufactured during the hours of sunlight. It was natural, therefore, to inquire when the lighted plants grew, and whether they grew more rapidly during their fewer hours of darkness, or whether they grew when the light was burning. By careful measurement and record it was found that Lettuce-plants grew about as much under normal conditions in daylight as in darkness, and the periodicity of growth was very irregular. The leaves of the Lettuce grew more rapidly in the lighted house for the first week or so, after which their growth became greater in the dark house—that is, the leaves matured more quickly under the light. The records show that the electric light did not determine periodicity of growth; that increase under the light occurred only during the first days, and that growth in both houses took place in daylight as well as in darkness.

Professor Bailey's first bulletin concluded with these words:

"On the whole I am inclined to Siemens' view that there is a future for electro-horticulture." The final statement in the present bulletin is: "I am convinced that the electric light can be used to advantage in the forcing of some plants."

Notes.

Mr. S. C. Moon writes to the *Farm Journal* that the choicest and best of the early Pears with which he is acquainted is Beurre Giffard. The tree grows feebly while young, and does not bear early, so that the best way to get this fruit is to top-graft cions of it on some old and thrifty tree of an unprofitable kind. They will then grow rapidly and in a few years bear abundantly.

Mr. James MacPherson writes us that *Lilium Wallichium superbum* has lived out for two winters with him in Trenton, New Jersey, planted on a steep bank and protected with a little litter. The bulb was set nine inches deep and did not flower the first summer although it formed buds. It commenced to grow this year early in May and produced two splendid flowers about the first of August. They were much larger than any of the longiflorum type, an old-gold color inside with dark brown anthers and a texture so durable that the flowers kept perfectly for ten days.

In a review of the Rose exhibitions of the year in England a correspondent of the London *Garden* says that the most successful exhibition Roses were old and well-tried favorites, the best among the hybrid perpetuals being A. K. Williams, Charles Le Febvre, Victor Hugo, Marie Baumann, Mrs. John Laing, Gustav Piganeau, Horace Vernet and Her Majesty. In the Tea class, Edith Gifford, Madame Cuisin, Innocente Pirola, Souvenir d'Elise, Comtesse Madaillac, Francisca Cruger, Maréchal Niel, Madame Hoste, Climbing Niphotos, Madame De Watteville, Ernest Metz, the Bride, Marie Van Houtte and Cleopatra.

Many of the Hickories of northern New Jersey are losing their leaves early on account of the attack of a fungus, *Phyllosticta caryigena*. In many cases trees were observed whose foliage was quite brown by the middle of September, while neighboring trees looked fresh and green. In one group of three Hickories, on one of which the foliage seemed quite dead, the trees on either side of it, and so close to it that their branches touched, seemed entirely intact. The explanation of this can only be that some individual Hickories are more susceptible to the attack of this fungus than others, and this is true of many other plants and many other fungi.

The October number of *Meehans' Monthly* contains a good picture of the Queen of the Prairie, *Spiræa lobata*, and in his account of the plant the editor calls attention to the fact that this plant affords a good illustration of the remarkable relationship between the Atlantic flora of North America and the flora of eastern Asia, a relationship to which the attention of men of science was specially called by Professor Gray. In many cases precisely the same species are found in both places, while in other cases the species, though differing, are so closely related that their differences are scarcely to be noted. *Spiræa palmata*, of Japan, so nearly resembles this Queen of the Prairie that a casual observer would pronounce them the same species, although a critical examination shows good botanical distinctions.

According to the *Kew Bulletin*, a tea made from a species of Orchid has been drunk for some fifty years in France, and, although it is an expensive luxury, finds an ever-increasing sale. It is prepared from *Angræcum fragrans*, a species allied to the Vanilla-plant, which has a strong aromatic odor. The leaves and stalks are simply dried, without any application of heat; and, to make the tea, a small quantity of them is placed in a closed vessel filled with cold water, and boiled for ten minutes. As with ordinary tea, milk, sugar or rum may be added to this decoction or not, according to taste, and it is said to be equally agreeable whether drunk cold or hot. Material sufficient to furnish fifty cups costs about fifty cents, and its name in Paris, as in Mauritius, whence the custom of using it is said to have come, is "Faham."

We have received from Mr. Curtis A. Perry, of Braintree, Massachusetts, specimens of what seems to be a double-flowered Morning Glory (*Ipomœa purpurea*). The leaves are heart-shaped and almost as those of *Aristolochia Siphon*. The flowers are very much doubled, of a blush white color streaked with a purplish blue. Mr. Perry writes that the

plant is now profusely covered with these flowers, which stand out well beyond the leaves and make a charming sight. The seeds were brought from Mexico three years ago, and seeds from the plant then grown have produced plants each year since, in which the flowers are true to their double character. Each year the plant has begun to bloom out-of-doors in September, but it flourished well as a pot-plant last winter in an ordinary furnace-heated house. Altogether it is a most interesting plant and promises to be a valuable one.

We have received the first number of *Gardening*, a semi-monthly paper published in Chicago, which, according to its announcement, is "gotten up with the view of aiding every one who is interested in a garden." The editor is Mr. William Falconer, who is widely known as a well-equipped writer on horticultural subjects, and who has been for many years head-gardener at Dosoris, Mr. Dana's beautiful country-place on Long Island, which has been more than once described in these columns. Notes from the ornamental and useful plantations of Dosoris will be a prominent feature of the new paper. Mrs. Royle, better known by her maiden name of Emily Louise Taplin, who is also an experienced writer, is a member of the editorial staff and will be permanently located at the Chicago office. The paper resembles the *American Florist* in size and appearance, and the first number contains eleven pages of well-prepared reading-matter.

A correspondent inquires whether the bulbs of Hyacinths which have bloomed in the house in winter can be used another season. The answer depends on how the flowers are grown. If they have been flowered in water the bulbs will be useless for the future. If, however, a bulb is planted in good potting soil, and the spike is cut off after the flowers have faded, the plant, if kept properly watered, will continue to live, and the roots and leaves will store up enough plant-food in the bulb for use another year. By the way, Hyacinth-bulbs and other Dutch bulbs which are needed for early flowering should be planted at once and put in a dark place, or left out-of-doors and covered up with soil or leaves until the roots have started. They should not be brought to the light for five or six weeks, and it will not hurt them to be frozen a little. In planting leave the neck of the bulb uncovered and have the earth firmly pressed about it.

The *Gardeners' Chronicle* for September 17th quotes at length, and with elaborate comment, Bulletin No. 41 of the Cornell Experiment Station on the "Comparative Merits of Steam and Hot-water Heating for Greenhouses," at the close of which we find the following editorial comment: "Incidentally, we may note the fact that the report which has formed the subject of our comment is itself founded upon a thesis prepared for a Bachelor's Degree by Mr. F. W. Card, at present a Fellow in Horticulture. Imagine a student of Oxford, Cambridge, and even London, writing a thesis on steam boilers for a Degree of Horticulture! Our American friends are a long way ahead of us in these matters, and while we gardeners are moaning over a low rate of wages, the overabundant supply of gardeners and inadequate social status, the Americans are extending the bounds of horticultural science, supplying a more thorough education, recognizing talent by means of university degrees, and thus, while raising the whole standard of efficiency, they are lifting the gardener to the position he ought to occupy."

About ten years ago, some three acres of land in this city, along the East River between Eighty-fourth and Eighty-sixth Streets, which had been a sort of beer-garden or picnic-grounds, were taken by the city and called East River Park. Under the Small Parks Act last winter, seven acres were added to this, which extended the water-front of the park to Ninetieth Street. Behind the park is a very dense population, and before it is deep water, which rushes through a narrow channel and always brings with it a cool breeze. The portion just added, and which is connected with the lower part by two bridges which span Eighty-sixth Street, was once an old homestead, and the house, a century old with broad piazzas, is left standing. There are some good trees on the grounds, among them an immense Button-ball, probably the largest on Manhattan Island. The plans for the improvement of this park have been adopted, and the Department is actively at work in making it ready, and it will be completed probably next year. No carriage-roads are provided, but there are playgrounds and grass and shade, and from the high bluff above the river the views to the north and east over the water are superb. Altogether it is a wonderfully attractive spot, and for its size it will be one of the most useful pleasure-grounds in the city.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLES:—Gardening a Human Bond.....	481
Women as Landscape Architects.....	482
Waste from Pine Forests.....	482
A Florida Live Oak. (With figures)..... <i>Dr. Robert H. Lamborn.</i>	483
Shongum.—III..... <i>M. H. P.</i>	483
Oil-making in Italy..... <i>Louise Dodge.</i>	484
NEW OR LITTLE-KNOWN PLANTS:—New Orchids.....	485
FOREIGN CORRESPONDENCE:—London Letter..... <i>W. Watson.</i>	485
CULTURAL DEPARTMENT:—Tomatoes as a Summer Greenhouse Crop.....	487
Garden Annals..... <i>E. O. Orpet.</i>	488
The Chionodoxas..... <i>F. N. Gevard.</i>	488
Seasonable Notes..... <i>W. H. Taplin.</i>	489
CORRESPONDENCE:—Fruits of Eastern Asia..... <i>T. H. Hoskins, M.D.</i>	489
The Apple-scab Again..... <i>Professor L. H. Bailey.</i>	490
Legislation against Injurious Insects..... <i>Professor John B. Smith.</i>	490
EXHIBITIONS:—Fruits and Vegetables at Boston..... <i>M. Barber.</i>	491
RECENT PUBLICATIONS.....	491
NOTES.....	491
ILLUSTRATIONS:—Live Oak (<i>Quercus Virginiana</i>) in St. Augustine, Fig. 82.....	486
Live Oak (<i>Quercus Virginiana</i>) in St. Augustine, Fig. 83.....	487

Gardening a Human Bond.

IF there is one pursuit that forms a link between human beings of different stations and habits, gardening is certainly that occupation, for whether it be the vocation or the avocation of man or woman, it appeals to so fundamental a taste that it makes a common ground upon which all can meet with interest and sympathy. It is the primal occupation of man; the final result and joy of his highest civilization. From the clod we come, to the clod we return, actually and figuratively, our fashioning from the dust of the earth pointing plainly to the fact that man was a graminivorous creation, deriving his sustenance from the grains he rescued from the tropic sands where he originated. It is a theory of the historical philosophers that man first developed into civilization in some rainless and unchanging region like Egypt, or the western slope of the Andes, and that there, under unvarying conditions of climate, he first established communities, and tilled the soil—hence, possibly, this old idea of his evolution from the dust of the earth.

As the animal with forethought to plant and dig was an advance upon his predecessors, so the agriculturist is a higher development than the nomad who goes in pursuit of his crops instead of waiting for them to come to him; and it is a curious fact that after man has circled the globe in pursuit of wealth or amusement, he comes back to the culture of his own acres as the most dignified and satisfactory ending of his career, the only one which is not an anti-climax. Contented and not inglorious, Cincinnatus returns to his plow, Washington to Mount Vernon, Jefferson to Monticello, and Mr. Gladstone to Harwarden. The spectacle of Mr. Pitt, happy in a three-years release from political life, and enthusiastic in the culture of his garden, is one unfamiliar to the world, which scarcely disconnects him from the great area in which he was the central figure, but is gratifying as an evidence of the humanness of that

great statesman, and of that solid wisdom of which he gave perpetual proof in his public career.

Poets and philosophers alike have rejoiced in rural shades, in the charm of pleasant labor among their flowers and trees. Gardening is the delight of royalty and the comfort of the cottager. The greatest ladies in England have taken pride in designing their own parterres, while the game-keeper's daughter rejoices in her little square of flowers. It is an occupation for the very rich, a solace for the very poor. It can occupy acres of territory, it can be carried on within the limits of a grocery-box. It is the priceless heritage of man, this right to till the soil, this joy in its accomplishment. Whether the results be utilitarian or æsthetic, the satisfaction is common to all, there is no monopoly of this privilege. In this great half-occupied country of ours, it is easily possible for a man to possess a morsel of territory for his own cabbage or marigold. There comes a period in the lives of most when this primal desire demands accomplishment. Then upon his fragment of the earth's surface a man sits down, and content begins. Not idle content, certainly, since only by the sweat of his brow can man overcome nature, but that discounted content which is the human substitute for happiness.

Results may disappoint in detail, but the aggregate produces a certain mental well-being which peer and peasant alike share. The triumph of the harvest is for all, and though there may be years when harvests fail, they are the exception. There may be a harvest of the spirit, even if the crops fall short, a gain in health and knowledge from the hours of labor that are a balancing gain for disappointment. It is not only material results we gather in, but the harvest of experience, the gain of wisdom, the science for the coming years, and in these human benefits there are no hampering trusts. The planter may sell his crops a year or two ahead, and find himself short of the market, but there is no corner in experience which confines it to a chosen few, and of this gain the gardener, be he high or low, may be sure, so that his labor can never be a dead loss.

Moreover, he who loves his garden is in touch with his kind, whether he find himself in Columbia or Cathay, for on this topic all may meet, the Russian mujik and the Czar, the Egyptian fellah and the Bey, the American traveler and the Daimio of Japan. There are gardens from Babylon to the Golden Gate which have delighted the heart of man from Eden until this day. To be cast out from a garden was the curse of Adam, and the struggle of fallen man ever since has been to repair that primal disaster. A hankering for an Eden is at the bottom of our wandering souls, and we are ever striving to fashion it to our conception of the lost Paradise. The idea is common to all—the expression varies in each individual. If originality inspires the owner, the garden will be original; if the conventionalities be dear to him, you will find formality in the arrangement of his flower-beds; the artist will interweave it with his taste and fancy; the poet will seek in it to embody his dream; the practical man will turn it into a Potato-field; the speculator will plant it with Wheat; a sentimentalist will fill it with Roses and Lilies; an æsthetic, with Sunflowers. And from whatever clime you come you will read the man in his garden, nor need an interpreter to explain him to you.

There is no region where man's effort to reclaim the soil does not possess an interest for all other men. No tale of the march of conquering hordes captivates like the story of the founding of a state, and the state's foundations are laid by its plowshares. In Egypt the great river has been harnessed for the service of man; in Holland he has fought the sea to win a foothold for his sturdy independence, a garden for his bulbs. With the Romans marched the culture of Europe; in the wake of their great armies sprang up the cereals and the trees of the forest. Cæsar was no less a conqueror of the soil than of opposing armies. He carried in one hand the sword, in the other the life-giving grain. To him, first of all, Britain owes the planting of her

barren acres with fruit-trees, with the Lime, the Chestnut and the Plane; possibly with the Elm itself, though Dr. Walker thinks that noble tree may have been brought there by a Crusader. And strange fact in the history of man, his triumph is the triumph also of the garden—its seeds and nuts, its grains and flowers springing up in the footsteps of Alexander and Xerxes, of Crusader and Spanish Don, to flourish and comfort long after the mailed hand that brought them was dust.

Thus in the path of the oppressor came a blessing, "out of the strong came forth sweetness." Here again that human touch links us with the old warrior of the past, bringing home from Damascus a Rose-slip to gladden the garden of his sweetheart, a sprig of vine to commemorate the hills of Palestine on the borders of some English lake. It is pleasant to think how the memory of his own garden made the Macedonian bring home to Greece the flowers that his master wrested from Darius. The Rose from Persia, the Lily of the farther East, are a bond of common interest between the old world and the new; between the mailed Past and prosperous Present. The Lotus of the Pharaohs is the glory of a Jersey mill-pond, the Pæony of the Hoang Ho is the ornament of a dooryard by the Charles, our very weeds bind us together to fight a common enemy, and thus the love and care of a garden brings man into fellowship with all the sons of Adam.

It was recently argued in these columns that it would be desirable for women of artistic taste to learn how to employ it in the proper planning and embellishment of the grounds of their homes, as well as the interiors of their dwellings. If women develop capacity in this direction there should be opportunity for their employment in a professional way. Some prejudices as to what constitutes a proper occupation for women would need first to be removed. We have in mind the case of a young woman whose father was superintendent of the park system, in a flourishing New England city, and who developed such a taste and capacity for the work that she became his most capable assistant. The eminent landscape-architect who had designed the parks of the place recommended, on the death of the superintendent, that his daughter be made his successor. She knew the duties of the position thoroughly and appeared altogether the most fit and competent person available for the position. The park commissioners promised to appoint her but failed to keep their word, giving as a reason that, while they really desired to do so, the local politicians would never sanction the appointment of a woman to an important position like that. Architecture is becoming a pursuit for women, and our leading architectural journal welcomes them to the profession, saying that their knowledge of household requirements makes them peculiarly valuable in the planning and designing of dwellings. There is no reason why women should not enter callings that bring them into the healthy life of the open air, if no hard manual labor is demanded. Therefore landscape-gardening is a suitable employment for those who are capable in this direction. Women are now giving themselves to horticulture and floriculture to a considerable extent; in the latter, particularly, their almost universal love of flowers gives them a peculiar fitness for such work. Schools for the training of girls in these employments would be admirable institutions.

In this connection a novel occupation for women, that has just been brought to our attention, is worthy of mention. The park commissioners of Lynn have recently established a carriage service in their noble great pleasure-ground, the Lynn Woods. At present but one carriage is run, and it is driven by the wife of the man to whom the contract was given, she being fond of open-air life. The fact is highly appreciated by the women who, with their children, form the great majority of the patrons, for their driver has a very pleasant and friendly way of pointing out the interesting features of the beautiful route. Why should not a woman,

who understands thoroughly how to handle horses, make an occupation of taking women and children on drives through interesting and pleasant places?

ALL persons who are interested in the preservation of our forests will be pleased to see any efforts to secure economical methods in the manufacture of lumber. Of course, there is a large amount of material which goes to waste, in the shape of slabs, edgings, etc. From twelve and a half to twenty-five and a half per cent. of every log is turned into sawdust, and in addition to the other waste not more than fifty or seventy-five per cent. of any log is used. A great many mills make laths and pickets and the like from slabs, but, after all, the amount of waste which is burned is enormous. In an article entitled the "Waste from Pine Forests," the *Northwestern Lumberman* comments on the large amount of good material that is wasted in such an instructive way that we give in a condensed form a portion of the article:

The examination of any slab pile will show that much of it can be converted into small articles of common use, which only require lumber which is too short to be used for lath, pickets or similar stock. Staves for pails and tubs, material for cutlery trays, a vast variety of small boxes, material for toys in endless variety, handles of domestic utensils, window-sash, blinds and screens, besides bridging and small stuff in house-building, can all be manufactured out of these waste products. Perhaps it is safe to say that all these articles, which are used within the limits of the north-west Pine states, could be made from the waste of the saw-mills which at present is destroyed at great expense, and is only a source of annoyance. This is especially true also of the Yellow Pine districts in the Pacific states. Only a small proportion of the articles named are manufactured in Washington, Oregon and California, that is, while these states are spending money to get rid of the waste of their saw-mills they are importing articles which could be made from this same waste. In any given quantity of logs in California, hardly forty per cent. of their cubical contents ever reaches the market in the shape of merchantable lumber, as can be seen by any one who examines the saw-mills among the red-wood or pine of the Cascade range or the Sierra Nevada foot-hills. The wastage in the Yellow Pine country runs from thirty-seven and a half per cent. to fifty per cent. of the cubical contents of the log, or, in other words, on an average not over fifty-eight per cent. of the log reaches the market. In England and Continental Europe and in the older states of the east almost every saw-mill has in connection with it some shop for working the refuse from the mill proper into merchantable articles, and in many cases the saw-mill is an adjunct of the other department instead of the reverse, so that the loss of the material of the log is reduced to a minimum in Europe. This working up of forest-products does not stop with the saw-mill waste, but takes up the waste in the forest itself during the process of logging.

In Massachusetts, Vermont and Connecticut, the great number of little mills have no necessity for a fire-pit, and the choicest pieces of waste can be carried away in a basket. Nowhere in Europe, except in the Scandinavian peninsula and in the Baltic provinces, is timber cut primarily for the sake of what is ordinarily called lumber. In most countries there are government regulations to prevent the loss of forest-material by manufacturers. Such an interference would be resented in this country, but it must come in time. If a man with a million dollars in paper currency should be found burning it up, the state would interfere to prevent his insane waste in the interest of his heirs and in order to prevent him from becoming a public charge, and the time is rapidly coming when the question of saving the waste of forest-products, together with saving the energy lost in the combustion of costly fuels, will demand the attention of the best brains of the country, if not governmental interference.

Certainly these are the most brilliant days in the year, especially when ushered in by a frosty morning which bears the same relation to a merely dry or foggy one at this season that a dewy morning bears to a parched and languid one in summer. The year seems ripened like a fruit by frost, and puts on the splendid tints of maturity but not yet the color of decay. It is not sere and withered as in November.—*Thoreau's Journal*, Oct. 10th, 1857.

A Florida Live Oak.

A SHORT distance to the westward of the Ponce de Leon Hotel, at St. Augustine, grows a Live Oak (*Quercus Virginiana*), which even the most impassive guest notices and admires as he drives by. The extremities of its lateral limbs, after the manner of the Live Oak when growing alone, almost sweep the earth's surface, and its branches form a singularly perfect hemisphere, as may be seen in the illustrations on pages 486 and 487, made from photographs taken in early March of the current year. A measuring line of fifty feet, drawn from the middle point of the first fork and through this hemisphere, will reach its exterior limits with remarkable uniformity at the tips of all the great limbs. The tree is on the ground of Mrs. Hanna, and the neighbors make the improbable statement that it was planted about a hundred years ago. Eighteen inches above the ground it is fourteen feet one inch in circumference, and the principal limb has a girth of six feet. This tree is doubtless the largest in its vicinity, but in the rich bottom-land of the St. John, near Jacksonville, I have seen specimens of the same species which I believe to be larger, and I have had described to me one on the Ashley River, near Drayton Manor, with a spread of branches one hundred and twenty-eight feet in diameter.

Enormous must be the torsional strains thrown upon the sturdy trunk of the St. Augustine Oak when the winds that sweep up from the sea twist and wrench the great whorl of tough limbs that seem a wheel of levers formed to tear the tree from its hold upon the earth. And the hurricanes have left a record of long and labored resistance, in the sinewy form of the bole, where swelling cords of fibre bind together limbs and roots, and the fine modeling of the wood suggests the welter arm of a wrestler whose muscles have been trained and shaped in the life and death struggles of the arena. This grand trunk is coated with a soft gray bark upon which the sunlight, reflected from the shining sand, falls with wonderful effect, illuminating a network of crisp ridges and channels, all finely wrought, incised, fretted and frosted as though cut and chased with the chisel and graver of some inspired artist from a mass of virgin silver ore.

New York.

Robert H. Lamborn.

Shongum.—III.

A MAN once made himself famous by bringing to notice the Providential nature of the fact that great rivers always ran near large cities. In humble imitation, let me suggest the beneficent intent with which a mountain-range of easy access, and so full of elements of health and pleasure, was placed so near the large centres of population on the Atlantic coast.

It is almost to be regretted, that the state cannot keep the right of eminent domain over these cliffs and lakes and forests, that may in time rival the primeval ones in grandeur. Wise forestry laws, and the planting of trees to produce the best quality of timber in places now denuded, or where the growth is worthless, would greatly increase the resources of the state and furnish employment and homes for many of its now idle citizens. Forests growing on the uplands would fill the diminished water-springs and fertilize the wide valleys of the Walkill and the Roundout. Fine-grained sandstone, which takes a polish like marble, is found here in unlimited quantities, and is well adapted for all architectural purposes. There is space enough in these vast solitudes for innumerable stately homes with wide lawns and sunny gardens, without encroaching upon the restful and health-giving recesses of the forest. The fine shale which underlies the sandstone and comes to the surface in various places could be used to make, through all the length of the range, roads as good for driving as those which now add so greatly to the attractions of Mohonk. Under the paternal government of Bellamy's dream, the region would support a large population in peace and plenty, and still afford breathing-space for the dwellers of the city in their hours of leisure.

From Millbank Mountain, which is nearly the highest point of the outside wall so abruptly separating this region from the valley, we came by an easy carriage-road to the edge of the cliff. Here we climbed a few steps upward over a glacier-polished dome, and looked down 1,300 feet to the farms below. Standing upon the bastion of the rock that projects a little below the highest ledge, we dropped a stone, and by timing its fall measured the depth of the abrupt descent. Seven hundred feet below it struck the flat top of the foundation-wall, and then bounded into the vale beneath. The strength of fibre in a Yellow Pine growing in this exposed situation

compelled admiration. Though it had been from infancy buffeted by the tempest, it had grown strong and straight, fully thirty feet high, with a well-developed crown of foliage. Its fellows were less vigorous, many even bent and broken, and some, like alpine trees, deliberately lay down to grow.

Millbrook and High Point, rising above the other peaks, look at each other evenly across a distance of a few miles. Sewockenomo and Onaghtin, chiefs of the Esopus tribe, must often have looked anxiously from these points over to the Hudson River, where colonies of the Dutch had been established. On May 16, 1664, they signed the treaty by which the whites took peaceable possession of the land. These historic names might well take the place of the common names the peaks now bear. Palmaghatt, which sounds oriental but is probably an Indian relic, is the name of a deep, narrow ravine, opening between two sections of these upright walls and ending in the upper valley beneath one side of High Point. It is two miles long, and in some places not more than thirty feet wide, with an average width of fifty feet. For most of the length these walls are from ninety to two hundred feet high, but as they widen reach a greater elevation. A small brook, fed by springs or by subterranean leakage from the lake, runs through Palmaghatt, but is so covered by broken trees and fallen rocks that though its musical tinklings are often heard three feet beneath the elastic surface, its waters seldom come to light. This deep, damp soil once nourished gigantic Hemlocks, long since felled and stripped of their bark. Their successors, which we trust the woodman of the future will spare, bid fair to equal them. Here the Yellow Birch also grows very large and tall, and to one looking down from above the ravine seems full of leafage like a bit of the primeval forest and must have afforded a safe hiding-place in the Indian wars.

Mossy Glen is a larger basin and similar to that through which the Awasting flows, but wider and more open to the sun. Its bordering walls hint at seismic disturbance, or the level strata seem to have loosened and twisted on their foundations, and at one point the great square rocks have fallen and are heaped together like the ruins of a temple. Here, too, the soil is deep. The smaller growth has been judiciously cut and the larger trees have space for full development. We measured a Black Birch seven feet four inches around, four feet above its roots, and a White Birch eight feet two inches, and there were many trees as large as these. There were many Hemlocks as large as those in Palmaghatt, and though most of the oldest trees had long ago been removed, their decaying stumps told the story of former grandeur. One recently cut lay on the ground entire and stripped of its bark; the butt measured forty-nine inches in diameter. The Birch-trees were unusually tall and straight, lifting their leafy canopies twenty feet above us.

These trees are also interesting from their power of adapting themselves to circumstances. I came upon one which grew with quiet grace beside a rock, but on one side had thrown out a buttress that divided itself into branches four inches in thickness and then run into the ground. On closer inspection I found that the supposed rock was the large root of an older tree decayed past all shape, while the stem lay behind it a mere bank of Mosses. Then I knew what had happened. The young Birch had begun to grow at the root of an older tree. Some other applicant for the same position had crowded it and curved its stem. The old tree fell one day and the Birch found itself with its face to the ground, its deformed back making a curve in the air. In the upheaval the crowding neighbor had disappeared, and the two lower branches that had before drooped near its roots were looking up to the sky. What messages were sent from head to foot, what answers were whispered by the trembling leaves, we shall never know, but these two branches have grown into tall trees of equal height, the parent stem and other branches having willingly buried themselves to sustain the symmetry of the favored pair. If these dumb children of earth could speak, what stories they might tell of fortune and misfortune, of fear and desire. To one who observes closely, there is so much individuality in native growth. It appeals to the imagination as nothing cultivated can do.

At the eastern end of Lake Minnewaska stand a Birch and a Hemlock, their twisted roots giving evidence of some dramatic incident in their early history. The water here is shallow and the border level for a space, and other trees grow straight and commonplace. But these in seedhood, perhaps, perceived some need of mutual help, or else struggled together over some plant-food until their roots became strangely interlocked, looped back and forth and twisted together like the limbs of athletes wrestling. But now Tsuga, without ap-

parent reason, leans out over the lake, and *Betula* holds him so firmly he cannot fall. I looked and wondered what history was thus told, until I thought I heard the *Hamadryads* laugh. The sound seemed to come from a distance, but that was, no doubt, a trick of the sly creatures. I have before spoken of the mixed growth of trees here, and the sudden transitions of level within a small area gives place for an equal diversity of flowers. Within four miles around the lake I have noticed seventy varieties of blossoming and fruit-bearing plants. The *Asters* and *Asteroidæ* are now in great wealth of bloom, and some varieties of special beauty. *Coreopsis* and many kinds of *Solidago* make the rocks and road-sides gay. Beside the *Peterkill* fall the *Chelone* contrasts its spikes of rose and purple with the white umbels of *Eupatorium*. *Heliopsis* and *Helianthus* show two variations, and there is a very fine *H. tuberosa* that I think has strayed from some garden. There are three kinds of *Trillium*. The *Montropa uniflora* is unusually large and beautiful in shady places, and I have found also the *Medeola Virginica* holding its purple berry in its crimson-tinted involucre instead of the white petals that drooped there when I saw it in April in the mountains of North Carolina. There is a rare and beautiful low-growing evergreen, *Corema Conradii*, to be found in *Palmaghatt*, and an aromatic Fern new to me, *Aspidium fragrans*.

The adaptation of soil and climate here to the growth of flowers is proved not only by the abundance of wild bloom, but by the rich beauty of the gardens at Mohonk. It has been said that we think we can improve upon nature by shaving a lawn and making impertinent flower-beds. But the skill with which groups of flowers have been massed in harmonizing or contrasting colors around the pretty pavilions and arranged to give effect to the wide sweep of the lawn, delights the eyes that may be a little weary with the monotony of woodland tints. On the higher levels of these mountains the prevailing growth is of Yellow Pine (*Pinus mitis*), but the Pitch Pine (*P. rigida*) is frequent, and here and there is seen a remnant of an older forest, *P. strobus*, standing high above the younger generation. Sometimes there is only a naked giant, scathed by lightning or killed by more ignoble fires, but often wearing a crown of sombre glory, and as vigorous as in youth. These trees, whose needles do not retain moisture as do the deciduous trees, increase the dryness of the pure sunlit atmosphere and give it the spicy and resinous fragrance so welcome to the invalid.

Minnewaska, N. Y.

M. H. P.

Oil-making in Italy.

THE Italian autumn gains a fresh picturesqueness from the active groups about the Olive-trees engaged in the harvest of this classic fruit, which is still treated with old-world conservatism, after the antique methods of the forefathers. On the ground are spread great sheets, upon which the fruit is heaped as it is gathered, and busy groups come and go around, even the old gray-foliaged twisted trees, whose tormented attitudes suggest always that they are at variance with the climate, and are fretting after a warmer region sheltered from Mediterranean winds and the cold breath of the *tramontana*.

The Olive-picking is a delicate business, for it is useless to gather the crop before it is ripe enough, and no less disastrous to delay a day too long, so in the heaps of gathered fruit quite a third of the berries are usually green. Like the high-bush Blackberry of our native land, the fruit turns from green through red to a bluish black. It needs gentle handling, and ought always to be picked by hand. Nor is this a difficult matter, for the trees, if properly cultivated, are well cut back to keep them stocky, while the branches are cleared out from the centre and trimmed across the top, at about fifteen feet from the ground, as smoothly as any hedge-row in England. Once brought to the desired shape and size, they can be so maintained for centuries. The flavor of the fruit is said to improve with the age of the tree. The Olive-trees on the slopes below *Tivoli* are said to have seen the Emperor *Hadrian's* sumptuous villa in all its splendor.

The men use ladders and take charge of the upper branches; the women, bare-headed or brightly kerchiefed, stand about and pick all the fruit within reach; children swarm about the ground for the fallen berries. They sing a snatch of some Tuscan stornello, which is taken up and carried on from tree to tree and orchard to orchard; but in the midst of the strain they break off to indulge in a bout of the most unsparing chaff, to dispute some mandate of the overseer, or to pay their respects to the *padrone* or owner of the property as he passes, mounted on his sure-footed little pony. Over all the sun is shining gloriously, in a sky so blue that the gray Olive-leaves

turn white against it, and so still as to seem almost unearthly to one accustomed to the atmospheric unrest of New England.

When their large, flat baskets are full the pickers take them to the granaries to be emptied. The sooner the berry can pass from the tree to the mill the better, says the Tuscan farmer, but though the machines are kept working night and day in the height of the season, they do not suffice if the crop be large, and the superfluous berries are carefully spread in thin layers upon dry floors. There is in the olive a thin watery liquid, the same which makes the fresh fruit at once so nauseating and bitter to the taste, and this, almost as soon as the olive has left the tree, begins to ferment and work its way out of the fruit. It must dry off at once or a mold forms upon the berries, which renders them absolutely worthless.

As soon as may be, therefore, the olives are picked over, cleared of leaves, washed, if necessary, and taken to the press. Since oil-making demands, above all things, an equable temperature during all its processes, the *oliviera*, as it is called hereabout, is usually installed under ground. Accepting an invitation to enter one of these the other day, we found ourselves, when once our eyes were used to the dim light, in a great branching cavern, hollowed out of the soft rock of the Sienese hill-side. Above was a roughly groined ceiling, on our right the olive-presses proper, before us the machines for crushing the fruit, and beyond a charcoal fire with a huge kettle of boiling water suspended above it. In a dark corner a door led to the inner cave, where the oil is clarified.

There were two crushing machines at work when we entered. The base of each consisted of a huge circular block of the yellow marble of Siena, seven feet in diameter, eighteen inches high upon the outer edge, and sloping inward to a depth of about six inches in the centre. Here was inserted a massive iron pivot, with a short arm attached to a mill-stone of the same beautiful stone as the base, and which was driven round and round in the cavity by one of those sturdy little ponies which are the pet and pride of every Tuscan farmer. Unwearyingly these two closely clipped, mouse-colored, willing beasts kept at their monotonous task, giving a friendly nip at one another as they met on their circling paths or responding to a caressing word by a hasty rub of the head on the shoulder or arm of the driver, but never lagging for an instant on their unending round.

Into the hollow of the lower stone is first thrown a heap of Olives, perhaps two or three pecks, a little boiling water is added and the horse starts off. The water has to be renewed from time to time, and the revolving stone, which has been so set as to detach the pulp as much as may be without breaking the stone of the fruit, not only bruises the berry but slowly forces the whole mass of pulp about the cavity. After some fifty minutes it will have made a complete revolution and it is then ready for the first pressing, which yields the finest oil. After this the pulp goes back to the mill-stones for a further crushing, is then repressed for second-class oil and the refuse of this is sold to the proprietor of a steam-press, who still succeeds in extracting a profitable amount of machine-oil.

Steam in new establishments often replaces horse-power at the crushing-mill, but the press is always worked by hand. It takes intelligence—and experience too—to tell when the screw has received a sufficient number of turns and when the pressure may again be increased. The crushed olives, called at this stage *lansa*, are confined under the screw-press by means of gabbie, which look, as you see them hanging before the shop-door, like elaborately twisted coils of clothes-line, but which are really bags woven in circular shape, each capable of holding two or three quarts of pulp. A half-dozen of these are slipped over the upright of the iron screw-press, which has long replaced the clumsy wooden lever of early Roman days, and pressure is put on most gently and cautiously for the first quality of oil, but with less precaution for the second grade when the stones have been crushed.

The oil, as it runs from the press to the great earthen jar beneath, appears of a brownish color, owing to the presence of the bitter watery liquid before mentioned. The specific gravity of this and of the oil proper is, however, so different that the work of clarifying begins at once and spontaneously. It is assisted and consummated in the dim inner dungeon, but the secret of this process is never revealed. The great vases of rude pottery are ranged about the walls, each displaying a more advanced stage in the clarification of its contents, till finally a beautiful smooth, translucent, greenish yellow liquid is revealed. But it is not wholly out of politeness, as we know, that the three workmen suspend their labors when we come in, and though their chief makes the round of the little room with the greatest affability and responds with true Italian courtesy to every question, his elaborate answers are distinctly vague.

"Water is used, in a proper quantity, at a proper temperature, which he himself determines; the oil is poured back and forth a proper number of times, when that seems the proper thing to do. The Signorine must find all these details very dry, and he asks their pardon for troubling them." The Signorine know at all events when questions are useless, and with an exchange of compliments take their leave.

When the oil comes out of the magician's black cave, it is ready for the market, but it is usually kept on hand for a time in a store-room, the floor of which slopes toward a central hole, under which a great earthen jar is set. If no breakage occurs, the only further care the oil receives is to be trans-vased as a precaution against fermentation when the great summer heats begin in June; otherwise it simply stands and waits its market. About thirty-five per cent. duty, ad valorem, is paid on it when it enters the city gates, and the shop-keeper doubtless takes his profit, but even so, the finest quality costs the house-keeper twenty-seven or twenty-eight cents a quart, and the finest quality is used, not only for the table and in cooking, where it admirably replaces lard and butter for frying and basting—but even in the tall classic lamps. "Anything but the very best always has an evil odor," the servants say, and they are doubtless right, but it always pains my New England thrift to see the beautiful greenish golden liquid put to so base a use.

Sienna, Italy.

Louise Dodge.

New or Little-known Plants.

New Orchids.

PLEUROTHALLIS SUBULATA, Rolfe.—A species allied to *P. cardiostallis*, Rchb. f., with cordate-oblong leaves and dark lurid purple flowers, from the collection of Baron Henby, of Peckau, Bohemia. Its native country has not been recorded.—*Kew Bulletin*, p. 137.

RESTREPIA ECUADORENSIS, Rolfe.—An Ecuadorean species allied to *R. antennifera*, Kunth, but with shorter lateral sepals and other differences, though with a general resemblance in coloration. It was imported by Messrs. F. Sander & Co., of St. Albans, and flowered in their collection.—*Kew Bulletin*, p. 138.

RESTREPIA SHUTTLEWORTHII, Rolfe.—A small brightly colored species, imported by Messrs. Charlesworth, Shuttleworth & Co., of Heaton, Bradford, and flowered both in their collection and at Kew. It is allied to the Guatemalan *R. xanthophthalma*, Rchb. f., but, besides other differences, the flowers are more heavily marked with crimson-purple blotches.—*Kew Bulletin*, p. 138.

DENDROBIUM PLATYCAULON, Rolfe.—A very singular species, introduced from the Philippine Islands by Messrs. F. Sander & Co., of St. Albans, with whom it flowered. It is allied to *D. lamellatum*, Lindl., but the flowers are twice as large and the lip quite different. The pseudo-bulbs are curiously flattened, and bear three to five leaves near the apex, and racemes of three to six straw-colored flowers.—*Kew Bulletin*, p. 139.

BULBOPHYLLUM DENSIFLORUM, Rolfe.—A small species allied to *B. triste*, Rchb. f., but with a long raceme of yellow instead of deep purple flowers. It is a native of the eastern Himalayas, and was sent to Kew for determination by Mr. N. Campy, The Gardens, Thedden Grange, Alton, Hants.—*Kew Bulletin*, p. 139.

ERIA CRISTATA, Rolfe.—A pretty little species, allied to *E. marginata*, Rolfe, and, like all other species of the section *Cylindrolobus*, having large petaloid bracts. The flowers are white, with some yellow markings on the lip and a hairy crest at the base of the front lobe of the same. It is a native of Moulmein, and was sent to Kew by Mr. C. Peché.—*Kew Bulletin*, p. 139.

ODONTOGLOSSUM AURICULATUM, Rolfe.—A pretty little species allied to *O. Lindleyanum*, Rchb. f., but differing in its hastately-trilobed lip, whose disk is light purple instead of brown. It was imported by Messrs. F. Sander & Co., of St. Albans, together with *O. Nœvium*, Lindl. The name is given in reference to the ear-like side lobes of the lip.—*Kew Bulletin*, p. 140.

ODONTOGLOSSUM GUTTATUM, Rolfe.—An interesting species allied to *O. odoratum*, Lindl., and *O. præstans*, Rchb. f.,

with light yellow flowers irregularly blotched with chocolate. It is a native of Ocaña, and flowered with G. R. le Doux, Esq., of East Molesey, in March of the present year.—*Kew Bulletin*, p. 140.

SPIRANTHES OLIVACEA, Rolfe.—A north Peruvian species, with olive-green leaves, marked with a few white spots, and light olive-green flowers tipped with faint pink, and a whitish lip.—*Kew Bulletin*, p. 141.

Kew.

R. A. Rolfe.

Foreign Correspondence.

London Letter.

TREE-PRUNING.—I refer to this subject because two American gardeners who lately visited England publicly found fault with what is done in good gardens here to keep young trees shapely. There are, apparently, people who take an interest in hardy trees and shrubs who object to pruning of every kind, holding that all plants should be allowed to grow their own way from the seedling stage to maturity. To prune, they say, is to interfere with nature and to destroy the distinctive character of the tree. With plants growing under natural conditions there can be little need for the cultivator's interference, but the conditions of every garden must be more or less unnatural for the bulk of the plants grown in it, and for them the gardener's art must be exercised. In every badly managed garden one sees crippled, one-sided, rickety, misshapen trees and shrubs which are distressing enough to the man who looks for health, vigor and true form in all the things of the garden. I know that unless young trees in the garden are looked after—that is, made to grow upright, form a backbone and keep in balance—the bulk of them will soon grow otherwise. Many people who are responsible for trees pay no attention whatever to their development, leaving the branches to form and take whatever direction they please, with the result that they often grow into something totally unlike what they are under favored natural conditions. My view is that the man who allows his young trees to grow one-sided, or the lateral branches to develop out of all proportion to the leader because he considers it an outrage on nature to prune, is just as wrong as one who would allow his child to become bow-legged for want of a little support, or round-shouldered for want of gymnastic exercise. Even nature will produce cripples, but we want none of them in the garden. To keep a tree shapely and in proper balance by judicious pruning is one thing; to clip it into a form unlike what it assumes naturally is another. There must be pruning, a good deal of it too, in all well-kept gardens.

PRUNING CONIFERÆ.—In many gardens coniferous trees become thin and scraggy owing to the excessive and uneven growth of the lateral branches. This, we find, can be rectified by pruning, the long, thin branches being shortened, in early spring preferably. It is surprising how soon the trees right themselves under this treatment, the "back" growth produced by the cut branches and the better development of the shorter ones filling up and furnishing the tree in a season or two. All conifers, both indoors and out, are improved in this way.

SCHOOL OF FORESTRY.—There has been some talk of a school of forestry for England for some years, and now at last it is announced that something of the kind is to be started in the Royal Botanic Garden at Edinburgh. The prospectus states that the scheme is intended to offer an opportunity to gardeners and foresters to study the sciences underlying the practice, as well as the principles of horticulture and forestry. It is proposed to extend the course over two and a half years and to find employment in and around Edinburgh for men desirous of taking advantage of the scheme, so that while supporting themselves by the practice of their profession, they could continue the course of special study at the Botanic Garden at such times as shall not interfere with the usual hours of labor. There will be no charge for the course. Only practical gardeners

and foresters are to be allowed to share the advantages of this scheme. There has been something of the same kind in operation at Kew for a considerable period, but it is limited to the young men employed in the Royal Gardens. They are expected to go through courses of lectures on physics, chemistry, systematic botany, geography, etc. In the winter they form a mutual improvement society for the purpose of reading and discussing essays upon horticultural subjects.

BOUILLIE BORDELAISE AND POTATO DISEASE.—Experiments, with a view to testing the value of Bordeaux mixture as a fungicide, have been made this year by Mr. H. F. Moore, for Messrs. Carter & Co., of High Holborn, and a report of the results furnished by them for publication. Last year similar experiments were made by Messrs. Sutton & Sons, Reading, with results which, on the whole, were unfavorable to the Bouillie Bordelaise as a cure for potato disease.

The following table gives the totals of the two duplicate experiments :

	Dressed plots. Cwt. qrs. lbs.	Undressed plots. Cwt. qrs. lbs.	In favor of dressed plots. Cwt. qrs. lbs.
Weight of sound tubers,	58 0 0	39 2 10	18 1 18
Weight of unsound tubers,	— — 11	6 3 11	6 3 0
Total yield,	58 0 11	46 2 4	11 2 7

It will thus be seen that in whatever aspect the experiment is looked at it is in favor of the dressing by the bouillie bordelaise. So far as sound tubers are concerned, the yield is about two tons per acre more than in the undressed portion (the two plots being less than half an acre), while the quality of the tubers is better.

The last meeting of the Royal Horticultural Society produced few plants of interest. A specimen in flower of Mr. Sturtevant's *Aristolochia Gigas*, grown in a six-inch pot, was the chief attraction. It was awarded a first-class certificate and the regret expressed that something better



Fig. 82.—Live Oak (*Quercus Virginiana*) in St. Augustine, Florida.—See page 483.

The report of Mr. Moore, however, is exceptionally favorable. I quote the following from it :

The experiment was made on a field of a little less than an acre of potatoes, which were planted in ten long double rows on April 8th, the drills being thirty-six inches apart. The whole piece was divided into four equal parts, of which the first and third were dressed with the mixture, and the second and fourth left undressed. The strength of the mixture was as follows: 22 lbs. of sulphate of copper, 22 lbs. of unslaked lime, and 100 gallons of water, this being the quantity necessary for an acre of potatoes. For the purposes of the experiment the first and third quarters were dressed with the mixture on July 11th and August 2d, and the second and fourth left undressed. The mixture was applied by the Antipest, the new knapsack distributor, invented by Mr. G. F. Strawson, which did the work admirably. On the second occasion, a German machine was also tried, this also doing good work. The mixture was applied thoroughly on both surfaces of the leaf. The disease appeared early in September in the undressed portions, and on Thursday and Friday, September 15th and 16th, a party of leading agriculturists and horticulturists assembled to see the final results of a trial which has created considerable interest.

could not be done to mark the high opinion of the plant formed by the committee. Two varieties of *Cattleya*, one called *C. Statteriana* and the other *C. aurea*, var. *Statteriana*, both remarkable for the small amount of crimson on the labellums, were shown by Mr. Statter, and Messrs. Veitch showed a new hybrid *Cattleya* named *Minucia*, which they had raised from *C. Loddigesii* and *C. labiata*, var. Messrs. Linden, of Brussels, sent two *Cyrtopodiums*, one named *C. macranthum*, having yellow flowers very similar to those of *C. cardiochilum*, the other named *C. Aliceæ*, with white flowers spotted with dull red. *Pteris nivalis*, a seedling form of *P. Victoriae* with broader pinnæ than the latter, received a certificate. Two large-podded Runner Beans, named respectively *Hill's Prize* and *Prize Winner*, were awarded first-class certificates, as also were four *Kidney Potatoes*, namely, *Reading Giant*, *Mary Anderson*, *Quantity and Quality* and the *Canon*. We have too many kinds of *Potato*. I grow two, which cannot be beaten here, *Early Rose* and *Magnum Bonum*.

London.

W. Watson.

Cultural Department.

Tomatoes as a Summer Greenhouse Crop.

VERY many garden crops are suitable to greenhouse cultivation, but the commercial grower is limited to those which will pay, and the decision of this question depends very largely on locality. In our large cities Cucumbers, Tomatoes, Cauliflower, and even other vegetables, can be grown with profit, but the kind of crops and their succession must depend on various circumstances. A recent bulletin of the Ohio Experiment Station, which is situated at Columbus, explains why they find it necessary to adopt a course which is quite different

the same is true of Beans. Cauliflower would not pay at the prices which can be obtained, but Asparagus, Pie-plant and Dandelions, although they do not command large money returns, can still be grown to advantage, because they utilize the space under the benches. Mushrooms, too, can be grown under the benches where there are no pipes, and this is a profitable crop.

This cultivation of Tomatoes in the greenhouse for spring and summer is not altogether novel, but it is not very widely practiced, and therefore we condense from the bulletin alluded to the report of Mr. E. C. Green, the assistant horticulturist of the station, which details the methods of cultivation. It seems probable that the system could be adopted in other places



Fig. 83.—Live Oak (*Quercus Virginiana*) in St. Augustine, Florida.—See page 483.

from that followed in other cities. The Lettuces which are most profitable there are Simpson's and Grand Rapids, both belonging to the non-heading class.

Two crops of Lettuce are taken from the beds, and the houses are then occupied by Tomatoes late in the season, when Lettuce cannot be grown profitably. The Tomatoes, if forced in winter in large quantities, cannot be sold to advantage, but in late spring and early summer they will bring prices almost equal to those which rule in midwinter, and the houses are occupied when they would yield nothing more valuable. It may be added here that Cucumbers can be grown in the place of Tomatoes, but they are less profitable. The quick-growing Turnip-rooted Radishes are fairly remunerative, and

near medium-sized city markets with profit. The house which is used for Tomatoes is occupied in the winter by other plants, while the Tomato-plants are kept in as small a space as possible. As a rule, vegetable houses are empty about the middle of May, when the last crops of radishes and lettuce are taken off, and after this time they can be used with a nominal cost for fuel, and no extra expense for filling benches with soil, so that altogether they make a rather inexpensive crop.

It has been the experience of Mr. Green that these house-grown Tomatoes have been in constant demand. In the midst of the strawberry and raspberry season tomatoes sold at fifteen or twenty cents a quart, which is twice the price of berries. When tomatoes began to come from the south it did not

interfere with the sale of the tomatoes from the greenhouse, because they were of such superior quality. The seeds of Tomatoes should be sown about the middle of December if the plants are to be ready to set in beds by the middle of March, or as soon as the crop of lettuce is out. The seeds should not be sown earlier than this, or the plants will become too large or injured by crowding. The plants need warmth and sunlight, and should be kept in a warm part of the greenhouse and never allowed to be chilled. Although they will thrive with less water than many other plants, the soil should not be allowed to get dry, while excessive watering should always be avoided.

After the plants are furnished with their second or third leaves they should be transplanted at least once more before they are large enough to be placed where they are to fruit. At the first transplanting they should be set two inches apart each way and twice as far at the second transplanting. When they are set where they are to stand finally they are planted directly in the soil, eighteen or twenty inches apart each way. Large pots and boxes, which are recommended for forcing winter plants, have been tried for these spring and summer fruiting Tomatoes, but they seem to have no advantage. The last transplanting should be done some time in March, for after the middle of this month the benches cannot be used for Lettuce profitably as the houses are liable to get too warm, and the abundance of Lettuce from hot-beds brings the price down. But when the Tomato-plants are set out, if good Lettuce-plants are set between them a fair crop of the latter may be grown before the Tomato-plants reach any considerable size. After the Lettuce is off, the Tomatoes should have the entire ground and should have a good mulch of fine manure, which will assist in holding water that is applied to the bed. The plants should be trained to one or two stakes, and a wire or string is a preferable support to stakes. The top may be made fast to the rafters and the bottom anchored by sharp wooden pins driven into the bottom of the benches or by wires stretched across near the surface of the ground. They must be tied to these upright strings or wires frequently as they grow.

Pruning is important not only because it increases the size and earliness of the fruit, but in order to get the largest yield possible in the smallest space and to keep the plants in the best shape. It is not the nature of the Tomato-plant to confine itself to one stalk, and when compelled to do so its efforts to grow side branches are persistent. Not only will sprouts come out of the axil of each leaf, but the ends of the blossom-stalks will develop into branches, and even the upper surface of the main vein of the leaves will send out sprouts. All of these must be taken off or there will be a tangled mass of vines if the plants are close together. The varieties which do well out-of-doors are the ones which will do well in the house for spring and summer. The best purple kinds that have been tested are Acme and Beauty. The best red kinds are Perfection and Paragon. The Lorillard, which is recommended so highly for winter-forcing, has not done so well under this system as some others. The early rough varieties are not desirable since pruning seems to make them more irregular. After a thorough trial the Atlantic Prize, one of the best of this class, has been discarded, and so have Hundred Day and King of the Earliest. The Dwarf Champion has some good qualities since the plants can be set closer together and nearer to the glass than other varieties. The first fruits that set are of fair size, while on some of the other varieties they are small. It is difficult to prune, however, because the heavy leaves hide the sprouts and it does not yield heavily.

Garden Annuals.

ANNUALS are more generally a part of the flower-border now than ever before in small gardens as well as in larger ones. This class of plants is popular because they do not require to be cared for through the winter, because there is a larger variety to choose from than formerly; and in most cases, also, with seeds sown where they are to flower, success is almost sure. Where a greenhouse, or even a hot-bed, is at command, a fine display may be produced with very little outlay. Home-grown seeds, carefully selected, may be planted with success, but seeds of first quality can be bought at low prices, so that there is no advantage in saving seed except in the case of some special varieties it may be desirable to perpetuate.

Among annuals recently introduced are the Marguerite Carnations, a most useful race of plants that give good double sweet-scented flowers the same season they are sown. There seems to have been too great demand for these seeds, and the producers have not given themselves time to weed out the

single-flowered kinds. This year more than half the plants have produced single flowers, a much larger percentage than when this strain of Carnations first became known. Our season here is too short for them unless they are raised early under glass and hardened off previous to planting out early in summer. I find it best to sow them in January, when they will flower soon after midsummer, and last until frost.

Coreopsis Drummondii is an annual species of great service for a continued display. The flowers are of good size, though not so large as those of *C. grandiflora*, but they are much more numerous, and may be cut for several months. This *Coreopsis* is also useful for winter-blooming; if sown early, and transplanted into seven or eight inch pots, it gives good returns all through the early spring months. The same applies to the yellow Corn-flower (*Centaurea suaveolens*), also desirable for cutting. Pot-culture suits both these plants best; in benches they are apt to grow too vigorous toward spring and to wilt during sunshine. *Coreopsis Drummondii* and *Centaurea suaveolens* may both be sown in the open ground at the usual season for a display in summer and late in autumn.

An annual climbing plant which has given us much satisfaction is *Dolichos Lablab*, the Hyacinth Bean. The panicles of flowers are very showy, both the purple and white varieties, but the clusters of seed-pods are a lasting ornament, as they turn a rich dark purple and keep this color until killed by frost. We sow the seeds where the plants are to remain during the summer; they grow rapidly and flower and fruit freely in a sunny position. In our section *Cosmos hybridus* does not flower in the open air as in more favored states, but is grown in pots and taken into the greenhouse in the fall, where it yields a harvest of beautiful long-stemmed flowers in the dull autumn months, when they are most acceptable. *Cosmos* is best sown in May; it flowers as soon and is not so tall as if sown earlier, and the results are as good; these plants are strong growers and require an abundance of food and moisture. Under pot-culture it is necessary to give these requirements several times a week. If this care is not possible they may be planted out in summer, lifted in the fall and planted in large pots.

Solanum ciliatum is a beautiful berried plant for winter decoration. When well grown the plants are as ornamental as a small Orange-tree laden with fruit, and much easier to obtain. Seeds are now offered in trade lists and should be sown early under glass and grown in pots during the summer. Our plants are in eight-inch pots and average about thirty fruits to a plant. These are a bright orange-scarlet, from one to two inches in diameter and grow along the under side of the branches. The shoots are pinched once or twice during the growing season to bring them into shape. The plants are now available for decorative purposes and may be used all winter, as the fruit is very persistent even after the foliage has fallen. It should be added that the specific name of this plant refers to an abundance of sharp spines on both sides of the leaves and on the branches.

For a bold ornamental foliaged plant for outdoor planting in summer, the new Tobacco plant, *Nicotiana colossea*, of seed catalogues, is much the best of its kind. The correct name is *N. tomentosa*. It is a colossal species that requires liberal treatment to do it justice. Our plants were raised late, and for this reason have not flowered this season, although they have grown about six feet high and show well in a large border. As an isolated plant *N. tomentosa* would be found useful, but it is too large for most borders. This giant Tobacco plant should be sown early under glass and planted out when a good size. It will then probably flower here as it has at Kew and elsewhere in Europe.

South Lancaster, Mass.

E. O. Orpet.

The Chionodoxas.

AT this time, when bulbs are being bought, attention may be called to the *Chionodoxas* as among the most attractive plants flowering early in the year. They should be grown in clumps and masses in the front border, where they succeed the Snowdrops. The bulbs are small and perfectly hardy, and increase rapidly, so that it is difficult to clear the ground from them when they are once established, as the small tubers are not easily found without sifting the soil. The *Chionodoxas* are not rampant growers, however, and do not endanger other plants. They are low-growing plants with narrow leaves; a radical-curved scape bears from three to ten flowers, which are usually erect.

Chionodoxa Cretensis is an old introduction. The flowers of this species are small, and in neither of its two varieties, blue and white, attractive in color. It is not often grown in gar-

dens, being neither effective nor interesting except in a collection. The popularity of *Chionodoxa* dates from the introduction of *C. Luciliae* from Asia Minor. This species has all the points of a good garden-flower, and is one of the brightest gems of the spring-time. The flowers from collected bulbs vary considerably, but good forms have flowers over an inch in diameter, with light blue tips and white centres. This species, which is also known as *C. Forbesii*, produces flowers more freely than the other kinds.

Mr. Edward Whittall, of Smyrna, during his hunting expeditions discovered that there were on the Taurus Mountains many bulbous plants unknown to cultivation, and, with an Englishman's natural fondness for flowers, organized a systematic search of the hills for bulbs which were likely to prove attractive in gardens. This work is carried on by the natives under direction. The country is in a shocking state of anarchy, even within sight of Smyrna, and the work is done at considerable risk. To Mr. Whittall we owe the following varieties, which have been introduced by his efforts: *C. Sardensis*, a dark blue-flowered kind, which has met with appreciation, the color being the blue of the interior of the cup of *Scilla Siberica*. As the *Scilla*-flowers are duller on the outer cup, *C. Sardensis*, with its upright flowers, is superior in its intensity of blue as seen in the borders. *C. Tmolusi* is a species collected on a height of this name, but appears to be a local variety of the *Luciliae* type, having a large white eye such as is often found in the type.

Chionodoxa grandiflora, or *gigantea*, was next found, and is a variety of much beauty, though it has met with slow appreciation. It has a flower somewhat larger and with broader petals than *C. Luciliae*, and the color is an opaque blue. The eye is very small and white. In my border the plants have shown only two or three flowers on each scape. The figure of this *Chionodoxa*, in a recent number of *The Garden*, is not satisfactory; the color is too deep, and linings are shown which do not appear in the flowers. Among bulbs of *C. Luciliae* some are occasionally found which give pure white, or rose-colored, flowers. The former are especially pure in color, and are very charming. Unfortunately, these are among the rarest of bulbs, and are not in the dealer's stock. This season Mr. Whittall has sent out a new species, *C. Alleni*, which he says is the finest yet found. As it comes without description, we trust it to the border with pleasant anticipations of a new charm to enjoy as the lengthening days of another spring bid it welcome to a new home.

Elizabeth, N. J.

J. N. Gerard.

Seasonable Notes.

CHRYSANTHEMUMS will naturally have a prominent place in the garden-world during the weeks to follow, and there will be many magnificent blooms at the exhibitions throughout the country; but the amateur cultivator must not look for similar flowers on the same varieties in his own collection, unless his specimens receive the same attention.

To secure the immense flowers seen at exhibitions the strength of the plant has been thrown into one or two blooms by a careful system of disbudding and feeding, and the foliage kept clean and free from insects. Unless the flowers are intended for exhibition, greater satisfaction will be had from more naturally grown plants, especially for conservatory and house decoration, and a large mass of reasonably good flowers will prove more effective than a few spindling specimens crowned with a single blossom that some one has sarcastically described as resembling "a variegated mop." Some disbudding should be practiced, however, as there is usually a superabundance of buds on most varieties, and tying and training should also receive some attention, without disfiguring the plants with a forest of stakes.

Where the conveniences are at hand, the vaporizing of tobacco extract is the most cleanly and effective method of removing aphides from *Chrysanthemums*. If this cannot be done, fumigating with tobacco-stems must be resorted to, either method being used at frequent intervals before the buds begin to open, in order to keep the plants thoroughly clean. Feeding with manure-water should also be persisted in, but with pot-plants care must be taken to keep the drainage open or the plants will soon suffer.

Among the earliest varieties I have noticed this season are *Eldorado* (Waterer), an excellent yellow of sturdy growth and fine foliage, and *Ivory* (Harris), a particularly good white either as a pot-plant or for cutting, being of medium size and excellent habit. Outdoor *Chrysanthemums* may be preserved from frost long enough to allow the full enjoyment of their flowers by covering them at night with water-proof muslin

stretched over a light frame-work of wood. The muslin may be procured from almost any seedsman for from six to ten cents per yard, according to the grade used. The present season has been a somewhat trying one for many outdoor operations. The lifting of stock from the open ground, as *Violets*, *Carnations* and *Bouvardias*, has been attended with some difficulty owing to the dry weather, but, as already noted in *GARDEN AND FOREST*, the success of this operation largely depends on the care with which the plants are treated after they are brought indoors.

It is desirable to grow a few Fig-seedlings (*Ficus carica*), in readiness for bedding out next season. In a mixed bed of foliage-plants these have a pleasing effect, the foliage of the Figs being both large and handsome, and seldom attacked by insects to any great extent. The experience of the past summer tends to confirm the value of *Crotons* and *Acalyphas* as bedding-plants, at least in this latitude; but it should also be remembered that while the *Crotons* will flourish in a greenhouse temperature of seventy-five to eighty degrees, it is not well to take the plants so grown directly from so warm a house and plant them out. When properly hardened off they are, however, among the most effective foliage-plants for outdoor decoration.

The *Crozy Cannas* continue to add to their fame with each succeeding season, and among the newer varieties *Alphonse Bouvier*, a green-foliaged variety, with large bright crimson flowers, takes a prominent place. *Paul Marquant*, also, is a fine variety, with some resemblance to *Antoine Crozy*, the flowers frequently over four inches in diameter. *Capitaine Suzzoni* is perhaps the best of the spotted type; the ground-color is yellow, over which is spread a profusion of red spots.

Holmesburg, Pa.

W. H. Taplin.

Correspondence.

Fruits of Eastern Asia.

To the Editor of *GARDEN AND FOREST*:

Sir,—I have read, with great interest and pleasure, the notice on p. 438, with an illustration of a Chinese Peach grown from seed at the Arnold Arboretum. I was also pleased to note Professor Sargent's remark, "that the Peach is now believed to be a native of China." The result of this experiment, so far as it shows a superior hardiness in this Chinese seedling Peach, is an argument that in transferring the fruits of the old world to America there must be taken into account the difference in climatic peculiarities between the eastern and western sides of these two continents. I believe that the more this subject is studied the more reason we shall find for seeking a renewal of our tree-fruits for eastern America from among those of eastern Asia. Professor Budd, of the Iowa Agricultural College, has been experimenting in this line, and the *Shense Apricot*, which originated from a seed sent to Professor Budd from a missionary station in northern China, has proved to have remarkable vigor and hardiness, and is being now quite extensively planted. I hope the resources of the Arboretum may be more extensively availed of to import the Chinese and Manchurian tree-fruits as well as other plants from that region.

I notice also Professor Bailey's article on scab-proof Apples, on p. 442. There is a certain amount of reason, undoubtedly, in the apprehension that new and apparently scab-proof fruits will not retain that characteristic long. That has been the case certainly with many of the seedlings which have originated in our northern states. They do well for a while, but in time fall a prey to disease. But it should be borne in mind that these seedlings are all from the old stock of west European varieties, and although such seedlings show some accommodations—some approach to what we call acclimation—and although nearly all our profitable Apples are of this class, yet there is a latent weakness in them all. It will not take many generations to advance the work to a point which we may reach much sooner if we extend our researches among the orchards of north-eastern Asia.

All this will, of course, take time, and the older among us can hardly expect to reap any personal advantage from these efforts to introduce a better race of tree-fruits into our country. It is very evident that all the tree-fruits of western Europe find themselves quite at home in western America. It seems at least equally probable that the tree-fruits of eastern Asia will find a congenial habitat in eastern America, and these are considerations that especially urge growers who find themselves located in the most unfavorable localities, where our old stock of tree-fruits are complete failures, now to pioneer the work of research. In the cold north and in that region of extremes,

the Mississippi Valley, the evils referred to are the more instantly pressing; but it is quite plain, from what Professor Bailey tells us, that in our most favorable localities on the eastern slope, where at first the finest fruit was grown without even ordinary care, it is now impossible to grow it regularly in marketable quality without resorting to the constant use of fungicide as well as insecticide spraying.

I certainly do not desire to take upon myself the rôle of opposition to the use of either fungicide or insecticide spraying. I am using both in my own gardens and orchards; but the use of them, and the necessity for that use, only make me the more anxious to obtain and test any and all varieties of fruit-trees and plants, adapted to our locality, which show exceptional resisting power against any and all the ills to which orchards and gardens are heir. Having attained this, the heavier portion of the task is completed, and we have only to concern ourselves with the details of the work. But so long as we have to contend with fundamentally unsound material our task becomes so difficult as to greatly discourage its prosecution.

Newport, Vt.

T. H. Hoskins.

The Apple-scab Again.

To the Editor of GARDEN AND FOREST :

Sir,—I have recently made a trip through southern Michigan, where the apple-crop is probably the smallest ever known. Everywhere the trees present a sorry appearance. The foliage is small and curled and brown, and even at a distance of half a mile the orchards appear to have been scorched with fire. Many trees are so badly affected that they have hardly cast a shade all summer. In some orchards I notice green tips on the branches, marking the renewed vigor produced by the late rains. Everywhere the apple-growers are discouraged, and they are wondering if the trees can survive such injuries. These are the same troubles as those which overran western New York in 1890, and which caused such widespread alarm. But in 1891 the New York orchards gave a fair crop of fine apples, and here is some consolation for the Michigan people. But the injury must seriously shock the trees, and, aside from the loss of this year's crop, the mischief must be considerable.

All this serious leaf-trouble is to be laid to fungi, which were enabled to develop with fatal rapidity in the wetness of last spring. It is probable that these fungi even caused much of the dropping of the little fruits themselves. It is evident that most of the dropping of the flowers is wholly natural, and to be expected, for, as a rule, only one fruit sets in a cluster of flowers. In most tree-fruits the fruitage is necessarily much smaller than the full bloom. Later on the drought came, and the injury added to the troubles from the rains and the fungi was complete. The orchards in the older part of Michigan now present a sad appearance. In northern Michigan, in the Traverse region, the apples are unusually good this year, and I am told that the rains did not begin there until after the fruits were well set.

The chief fungus concerned in this scourge appears to be the fuscladium, or scab-fungus, which causes the familiar black scab-like spots on the fruit, as well as a blight or mildew of the foliage. The scab-fungus injury upon the leaves usually appears as grayish or gray-brown blotches, appearing to rest upon the surface, and not completely killing the tissue beneath it. But there is another injury of the leaves characterized by a complete dying of the tissue, so that the leaves become winter-brown in patches or along the edges. This injury is possibly due to a *Phyllosticta*. Professor Beach, of the New York State Experiment Station, tells me that still a third fungus appears to be concerned in this Apple-leaf blighting. The occurrence of two or more fungi in these scourges has been mentioned several times by recent writers, but the exact part which each plays in the destruction of fruit and foliage has not been determined. It seems to be generally agreed that the scab-fungus is the most mischievous.

In connection with the discussions now running in GARDEN AND FOREST concerning the relation of certain varieties of Apples to the scab, it may be worth while to make a record of the behavior of the blight in my father's orchard in south-western Michigan. Some of the varieties here recorded are represented by a single tree in the orchard, but the most important varieties are in good number, especially Rhode Island Greening, Baldwin, Stark, Northern Spy, Esopus, Spitzenburg, Golden Russet, Talman Sweet and Swaar. I have thrown the varieties into three categories as well as I can: 1. Those very badly injured, which for weeks have hardly cast a shade, and in which none of the leaves have reached normal size, the trees presenting no green color. 2. Those much injured, in which some of the leaves reach normal size and the trees present a

somewhat green appearance, but none of the leaves are free from conspicuous injury. 3. Those little injured, in which all the leaves attain normal size and the tree looks full, but all the leaves are marked by scab. I found no varieties which I could put into a fourth class, to be characterized by no injury whatever. It remains to be said that all varieties without distinction, save, possibly, a few trees of Flower of Genesee, failed entirely to produce fruit, although they all blossomed full.

1. Varieties very badly injured: Baldwin, Belmont, Bunker Hill, Chenango, Early Harvest, Esopus Spitzenburg, Golden Russet, Grimes' Golden, Jonathan, Newtown Pippin, Nickajack, Northern Spy, Rambo, Rhode Island Greening, Paw Paw, Siberian Crab, Stark, Summer Queen, Surprise, Swaar, Tompkins King, Westfield, Seek-no-further, Williams, Yellow Belle-fleur.

2. Varieties much injured: Beehouse, Fall Jenneing, Fall Pippin, Holland Pippin, Stark, Stode's Birmingham, Swaar, Talman Sweet, Transcendent Crab.

3. Varieties little injured: Baldwin, Cabashea, Cloth of Gold, Cogswell, Egg-top, Flower of Genesee, Northern Spy, Red Astrachan, Red Canada, Rhode Island Greening, Roxbury Russet, Sweet Bough, Transcendent Crab, Twenty Ounce.

It will be observed that some varieties occur in two lists. The Baldwin, Northern Spy and Rhode Island Greening, for instance, occur in the worst and best lists, yet the trees, so far as could be seen, were equally exposed to untoward circumstances. Some Baldwins were almost defoliated, and none of the leaves had reached more than half-size, while others in the same orchard might have been passed by the casual observer for trees in perfect health. Some young and vigorous Baldwin-grafts were scarcely injured. The blight appears to affect the various varieties differently. The foliage of Beehouse and Sweet Bough, for instance, presents a thick and conspicuously curled appearance, much like the leaves of Snowballs which are attacked by aphides.

At the recent meeting of the American Horticultural Society in Chicago several persons spoke of the comparative immunity from scab of some of the hardier Russian Apples, and it seemed to be a prevailing opinion that a more or less immune race of Apples can be bred from them. I hope that this prophecy may come to pass. It is an interesting field, but I cannot rest my faith entirely upon it for ultimate and permanent results. It is certainly expedient to extend the operation of spraying at the same time that we are striving for resistant varieties. In years like the present, the best efforts are likely to give indifferent results, but I believe that spraying every year will lessen the evils of the bad years.

Cornell University.

L. H. Bailey.

Legislation against Injurious Insects.

To the Editor of GARDEN AND FOREST :

Sir,—The editorial on "Legislation against Injurious Insects and Plant Diseases," in your issue of September 28th, is both important and timely, and merits the careful consideration of every association of agriculturists in all parts of the Union. In New Jersey there is already a very strong feeling among the farmers who are following experiment station advice, that something should be done to protect them from the neglect of their less progressive neighbors, and the subject will be agitated in the county boards and probably also in some of the state societies during the coming winter.

Allow me to give two examples of the necessity of some action. The pear-midge (*Diplosis pyrivora*) has been, quite recently, introduced into New Jersey, and is slowly spreading. It reached New Brunswick in 1891 and settled in a neglected orchard not far from town. The owner of this orchard has other business and simply allows it to take care of itself. The trees are old, diseased, infested by insects and, except in rare cases, produce no marketable fruit. Closely adjoining is a Pear-orchard, whose owner uses all means to get fine, perfect fruit. The trees are healthy, are kept free from disease and insects by the intelligent use of the fungicides and insecticides, and bear heavy crops of the finest varieties of pears—fruit that takes premiums annually wherever exhibited. In the spring of 1892, a few midges found their way to this orchard and a few Pears were infested. Vigorous means were at once adopted to destroy them; but what is the advantage? In the neglected orchard close by, at least fifty per cent. of the fruit was infested early in the season, and thousands of midges will mature there next spring and will not all remain in the old orchard. Despite all preventive measures, the good orchard will suffer and the owner will lose a considerable sum, simply because his neighbor will not care for his own property.

In Atlantic and Cumberland counties, large tracts are de-

voted to Blackberry culture, and much fruit of fine flavor and good size is shipped to northern, eastern and western markets, as well as to New York and Philadelphia. The most serious enemy to Blackberry culture is the red-necked cane-borer (*Agilus ruficollis*), which is yet very easily controlled by cutting out the galls when pruning in spring, and burning the cuttings. But of what avail is it to the intelligent grower if he cuts out all the galls in his field carefully, if his neighbor allows those in his field to stand? For several years last past this insect has steadily increased in number, and a tax of fifty per cent. on the crop of the two counties is a low estimate of the injury caused in 1892. On many acres the crop was not considered worth picking, and the fields were allowed to take care of themselves. They have done that so well that early in September I found many of them in which every new cane was galled, and in some canes as many as ten and even twelve galls were on a single cane. The host of insects that will develop there next spring will not find canes for one-tenth the females that will desire to oviposit, and they will fly to the neighboring well-kept fields, and will levy their tax on the innocent and careful grower as well as on the guilty careless one. There are hundreds of acres scattered in these two counties which will, next year, produce more insects than Blackberries, and which, for the benefit of others, should be utterly destroyed this winter.

It is a maxim of the common law, that every man must so use his own property as not to injure his neighbor or others; but it is a matter of very grave doubt whether any attempt at redress under this maxim would be successful under the present circumstances. Certain it is, that there is no justice in allowing one careless individual to impose a heavy tax on all his neighbors. A man who raised foxes and turned them loose in his neighbor's chicken-yards would be brought up with a round turn very suddenly. There is no reason that I can see why one who willfully breeds insects to infest his neighbors' orchards stands on a different footing.

I hope you have not said your last words on this subject.
Rutgers College, New Brunswick, N. J. *John B. Smith.*

Exhibitions.

Fruits and Vegetables at Boston.

THE fruit and vegetable show of the Massachusetts Horticultural Society, held at Horticultural Hall in Boston during the first week of this month, was, in point of exhibits, a noteworthy success. The somewhat slender attendance was a new proof of the lack of public interest in the efforts of specialists who have given so much study and time to improving the quality and beauty of table fruits and vegetables. It is to be regretted that the efforts of our best horticultural societies meet with so little appreciation.

The fruits at the recent exhibition occupied the entire upper floor of the building, and the vegetables were arranged in the spacious hall beneath. Apples were largely represented, and some idea of the extent of this display may be gleaned from the fact that no fewer than two hundred and seventy dishes, illustrating about thirty varieties, and averaging twelve specimens to a dish, were placed in competition. The contributions of pears were larger still. There were two hundred and ninety-five dishes, each containing twelve samples. Some twenty-eight varieties were shown in their finest form, so that the display was as beautiful as it was extensive.

Grapes, especially the native kinds, were plentiful and of good quality. The state Agricultural College at Amherst and Mr. Benjamin G. Smith, of Cambridge, were the principal exhibitors of domestic varieties, and these growers, with several others, supplied the total of 165 plates of six bunches each. The Amherst exhibit contained sixty-one distinct varieties, and it afforded grape-growers an opportunity for selection which comes too seldom. The first prizes for foreign grapes went to Mr. J. Monteith, gardener to Geo. A. Nickerson, of Dedham, and Mr. John Ash, gardener to Mrs. J. W. Clark, of Pomfret, Connecticut. The former was first in four classes, with Gros Moroc, Golden Hamburg, Black Hamburg, Ali-cante, Buckland Sweetwater and Muscat of Alexandria, and the latter in one class, with Black Alicante, in every respect the best grapes in the hall.

Mr. George S. Curtis, of Jamaica Plain, was an easy first in Quinces. Some splendid orchard-house examples of the Late Crawford Peach were shown by Mr. Robert McLeod, gardener to D. B. Fearing, Esq., Newport, Rhode Island; Mr. N. D. Harrington, of Somerville, secured first for the same variety grown out-of-doors, and a like honor was conferred on

Mr. W. D. Hinds, of Townsend, for the Crosby. Plums were of indifferent quality, and prizes were given to Mrs. Mary Langmaid, of North Somerville, and Mr. E. S. Grant, of Concord. Mr. C. Terry, of North Weymouth, was the only exhibitor of Cranberries, and Pine-apples were contributed by Mr. Jackson Dawson, of the Arnold Arboretum. Some curiosities were furnished in the form of a branch of the Sheldon Pear, with a close cluster of seven fully developed fruits at the extremity, and in a dish of Endicott pears from a tree imported from England by Governor Endicott in 1636.

The vegetables, embracing all the best seasonable sorts, were numerous and of first-class appearance. The miscellaneous exhibits included a collection of hardy flowers from the Harvard Botanic Garden, some vases of creditable single and double Dahlias from C. E. Josselyn, of Framingham, four dishes of very fine flowers of tuberous-rooted Begonias from Francis Brown Hayes, Esq. (Mr. James Comley, gardener), of Lexington, and a nice group of *Streptocarpus*, from Mr. Wm. Martin, gardener to Nathaniel T. Kidder, Esq., of Milton. Mr. Kidder was successful in obtaining the first prize for a collection of flowers of forty herbaceous plants, the Shady Hill Nursery Company, of Cambridge, being second.

Recent Publications.

Dictionary of Botanical Terms. By A. A. Crozier. Henry Holt & Co.

The science of botany has developed on so many lines within the last twenty years that there has been necessity of creating a great many new terms, and it is also true that many of the old ones have been practically abandoned, and inasmuch as it has been almost a score of years since any English dictionary of botanical terms was published there is abundant demand for a book like this. The modern study of structural and physiological botany is responsible for many of the newer terms, but improved practice in agriculture and horticulture, as well as the advance in the sciences on which both these arts are based, has also made many new words necessary. This book of Mr. Crozier's seems to be very complete in both the practical and scientific sections and will be a welcome addition to many reference libraries.

Fruit-culture. By W. C. Strong. Rural Publishing Company.

This little hand-book was first published seven years ago, and was intended to furnish condensed and simple directions for the average owners of homesteads who wish to raise a few fruits for home use. So great, however, has been the advance in the practical methods of protecting crops from insects and fungi that a book seven years old is quite behind the times. Mr. Strong has, therefore, prepared a new edition, in which he has attempted in a concise way to embody the results of recent experience with various insecticides and fungicides, and the methods of applying them. Of course, in a brief two hundred pages, nothing like extended description of varieties of different fruits can be looked for. The book contains, however, in a very compact form, the best methods of cultivation for each separate fruit and some descriptions of the best varieties, with illustrated directions for propagating trees from the seed, by cuttings, by layers, by grafting, etc. The book is not intended to supersede the more exhaustive treatises which have been written for those who wish to grow fruit on a large scale, but for the inexperienced cultivator Mr. Strong's book will be welcome and helpful.

Notes.

The white form of *Plumbago Capensis* is comparatively rare, but it resembles the species in almost every respect except in the color of its flowers, and the two together are admirable companions.

Mr. John Westcott, who is well informed on such matters, is reported in the *Florists' Exchange* as saying that in the neighborhood of Philadelphia there are fifty houses full of *Chrysanthemums* in excess of the quantity produced last year.

A Douglas Fir was planted in the spring of 1842 at Walcot, the seat of the Earl of Powis, in Shropshire. This spring, after it had stood fifty years, it measured one hundred and seven feet to the top of the leader, and at four feet from the ground the girth of its trunk was twelve feet nine inches.

The planting of the dunes at Blankenberghe, near The Hague, in Holland, begun on a great scale three years ago, is being steadily carried on. So successful has been the work

that in some of the places first planted certain of the selected species have already attained a height of more than six feet.

The leaves of *Spiræa prunifolia* remain on the shrub very late in autumn, but they begin to turn among the first. They change very slowly from glossy green to deep crimson, and although the plant has a more whippy habit than most of the *Spiræas*, for October coloring, it is one of the very best of shrubs.

A Portugal Laurel at Combermere Abbey, in Cheshire, is said to be at least two hundred years old, and its branches have rooted in every direction. It has the appearance of being a large mass of shrubbery instead of a single Laurel. In places it is thirty feet high, and altogether it is a hundred feet in diameter.

The leaves of the Hickory are easily scorched by frost, and, therefore, in seasons when freezing weather comes early, the foliage turns brown and withers early. But in years like this, when frosts are delayed, the leaves ripen to a clear lemon-yellow, so that the Hickory becomes fairly luminous and is one of the most striking of our native trees, which are famous for their autumn colors.

A variety of *Helenium autumnale*, named *Striatum*, has lately received a first-class certificate in England, and it promises to be a welcome addition to our late-blooming hardy plants. It is particularly interesting because of its colors. The disk is spoken of as maroon and gold, and the florets are a rich red striped with yellow. Autumn gardens contain so many composites in which the prevailing color is yellow that this variation will be a pleasant relief.

As the Memorial Garden, which lies between Longfellow's Cambridge home and the Charles River, attracts so few visitors that it is believed its commemorative character is not generally recognized, it has been proposed to make this clearer by the erection of some sort of a monument to the poet. But, as the Longfellow family does not approve of this scheme, preferring the unmarked quiet open garden, it is probable that it will not be carried out.

Some years ago an oak-trunk was found buried at a depth of thirteen feet in a sand-pit at Musselburg, Germany. After examining the strata in which it had lain, Professor Geikie decided that it was a relic of the later stone age, and must be some 6,000 years old. Yet the great trunk, which was no less than five feet nine inches in diameter, was so perfectly preserved that it was worked into an elaborate chimney-piece, which now ornaments a house in Edinburgh.

A late bulletin of the Rhode Island Experiment Station gives a word of caution to the purchasers of wood ashes. Analysis of the ashes which is sold in that state shows that they vary widely in chemical composition and fertilizing value. In some instances they were of such a low grade that farmers were advised to demand of the dealer a guarantee. If farmers would always insist on such a guarantee and order samples sent to the state experiment station, the quality of the ashes sold would soon be improved and they would all contain such an amount of phosphoric acid and potash as would make them worth buying.

At present the use of birch-bark as a writing material is merely a diversion of the tourist, but in earlier years, as we know, the Indians put it to serious service, while in Europe the bark of the White Birch was an occasional writing material before the invention of paper. In India one of the most ancient of all writing materials was the bark of the Himalayan Birch (*Betula Bhojpattra*), allusions to it being found in books 2,000 years old. To-day this substance is employed as a lining for boots and shoes, but only charms and amulets are written on it, because of its great durability. The magic words are inscribed upon a small bit, which is then enclosed in a bead of gold or silver or brass, which is worn on the person.

Since Cypress lumber is being dried by artificial means, the product is much superior and the demand for it has largely increased. Several large Louisiana mills, we are now told by the *Northwestern Lumberman*, have been supplied with steam-heat kilns, in which there is no ventilation and an extraordinary dampness of the atmosphere. In this veritable sweat-box the sap and natural juices of the timber are actually steamed or boiled out of the fibre of the wood. The bottom of the kiln is of sand, into which the drippings from the wood drop and saturate it until it is converted almost into mud. After the heating process is continued for a certain length of time the kiln is opened, the air admitted, the moisture dissipated and the lumber turned out to dry.

The *Gardeners' Magazine* for September 24th contains an engraving of the comparatively new *Polyantha Rose*, named Turner's *Crimson Rambler*, which was brought from Japan a few years ago and received a gold medal at the International Horticultural Exhibition. The growth is very robust, and in July, when the truss was selected for figuring, thousands of plants which had been budded the previous summer had made shoots ranging from six to eight feet high. The trusses are produced in succession so that the display is maintained over a considerable period. The color of this Rose is described as a glowing crimson, and the truss figured contains a mass of more than fifty flowers fully opened, besides numerous buds all closely packed in a pyramidal mass.

So few formal gardens exist in this country that it is worth while to call attention to the picture of the one connected with the old convent school for girls at Georgetown, near Washington, which is published in the *Cosmopolitan Magazine* for October. This garden, which seems to have been laid out in the early years of the century, is, if one may judge from the picture, not a remarkable one in any way, yet it shows how attractive may be a combination of naturally developed trees, with systematically arranged paths, borders, grass-plots and flower-beds. And, as has often been said in these pages, such a combination might be made as beautiful and appropriate in small grounds attached to dignified buildings as are our customary attempts at landscape-gardening on a miniature scale.

A note in one of the daily papers announces the sale to a Baltimore syndicate of the Dismal Swamp Canal for the sum of \$10,000. This famous canal connects the waters of the Elizabeth in Virginia and the Dismal Swamp with the Pasquotank in North Carolina and is twenty-three miles long. Its construction was authorized by act of the Virginia Assembly in 1787, and George Washington was its original projector. It cost \$1,500,000. The new owners propose to "improve the waterways and develop the timber-lands," which are very valuable and include tracts of Cypress and other trees of large size. With the exception of the main Jericho Canal and a few smaller passages and Lake Drummond, some ten miles in the interior, the swamp is practically impenetrable on account of the dense growth of Cane-brake.

The report of the Director of the Kansas Experiment Station contains an article on the contagious diseases of the chinch bug, which is pronounced by Professor H. T. Fernald, in *Agricultural Science*, one of the most valuable contributions to economic entomology which has lately appeared, ranking in importance with the introduction of the *Vedalia* into California. The experiments were begun in 1889, and healthy bugs placed in jars with diseased ones quickly became affected, and the field-trials showed that when a number of these diseased bugs were liberated where others were abundant the disease spread rapidly. In 1891 fourteen hundred field-trials were made, and more than three-fourths of these were so successful that the saving of the crops was estimated at more than \$87,000, or \$181 to each of the 482 farmers who tried the experiments. In the opinion of Professor Fernald this report marks the first apparently successful entrance of entomology into an almost unknown field, where much progress is to be hoped for. He believes that the cultivation of the natural enemies of our insect pests and the keeping of stocks of them on hand for shipment to infested areas is a line of work which must prove of great value. Any one who bestows a little thought on the relative advantages of insecticides applied by hand on the one side, and of parasites which are able to pursue their hosts from place to place and spread disease by infection on the other, will see that the latter is theoretically, at least, the most effectual and satisfactory.

Catalogues Received.

H. G. FAUST & Co., S. W. cor. Front and Arch Streets, Philadelphia, Pa.; Wholesale Fall Catalogue.—HAAGE & SCHMIDT, Erfurt, Germany; Seed Novelties for 1893.—W. B. HARTLAND, Cork, Ireland; Daffodils and other Bulbs and Flower Roots.—FRED. W. KELSEY, 45 Broadway, New York; Choice Hardy Trees, Shrubs and Plants.—HARLAN P. KELSEY, Linville, North Carolina; Native Plants of the Southern Alleghany Mountains.—THOMAS MEEHAN & SONS, Germantown, Phila., Pa.; Trees, Shrubs, Vines and Evergreens.—JOHN SAUL, Washington, D. C.; Wholesale Catalogue of Fruit, Evergreen and Ornamental Trees, Shrubs, Roses and Greenhouse Plants.—SCHLEGEL & FOTTLER, 26 South Market Street, Boston, Mass.; Fall Bulbs.—THE TOTTENHAM NURSERIES, Ltd., Dedemsvaart, near Zwolle, Holland; Wholesale Trade-list of Conifers, Rhododendrons, Roses, Herbaceous Plants, etc.—J. C. VAUGHAN, New York and Chicago; Vaughan's Book for Florists, Wholesale Price-list of Seeds and Bulbs.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLES:—Botany in the Agricultural Colleges	493
A Reclaimed Swamp. (With figures.)	494
Gifts of Palms and Tree-ferns to the World's Fair	494
The Supposed Correlations of Quality in Fruits Professor L. H. Bailey.	495
NEW OR LITTLE-KNOWN PLANTS:—New Orchids R. A. Rolfe.	497
FOREIGN CORRESPONDENCE:—London Letter W. Watson.	497
CULTURAL DEPARTMENT:—Grafting Grapes E. G. Lodeman.	498
The Herbaceous Garden M. Barker.	500
Roses W. H. Taplin.	500
Lilies in Autumn C. L. Allen.	501
Anthraxnose of the Pear Professor Byron D. Halsted.	501
CORRESPONDENCE:—The Future of the Fair-grounds X.	501
In the Redwood Forest Charles Howard Shinn.	502
RECENT PUBLICATIONS	503
NOTES	504
ILLUSTRATIONS:—Part of a Reclaimed Swamp, near Clifton, New Jersey, Fig. 84.	498
The Sacred Lotus in a Reclaimed Swamp, Fig. 85	499

Botany in the Agricultural Colleges.

SOME time ago Professor Bailey, in a suggestive contribution to *Science*, made a plea for a broader botany. We quoted largely from the article at the time of its publication and will only repeat that the fact complained of was the restriction of botanical science to the study of wild plants. This was natural in earlier days, when there was little attempt to apply science to cultivation, but since the theory of evolution has come to be accepted, a new purpose has been given to the study of all natural objects, and cultivated plants especially have gained a fascinating interest because they furnish such conspicuous examples of variation and heredity. The great mass of material which the multiplied species of cultivated plants afford can be made to illustrate the accumulative effect of modified environment and selection under the influence of human care as wild plants cannot possibly do. They can show within a brief period as much progression in definite lines as their wild prototypes could show in ages. This makes the garden one of the best places in which evolution can be studied. But the point which it is proposed here to insist upon is, that more and more it should be the endeavor of those interested in agriculture and horticulture to bring into practical use the facts and laws which science discloses, and make them actually helpful in the cultivation of plants. The study of botany as pure science, the investigation of the laws of plant physiology and variation under different conditions, can have abundant application in improving the quality and changing the character of economic plants as well as in developing new and better methods of cultivation. This means that not only should increased attention be given to the study of fungi and bacteria and other special branches of the science, but that more attention should be given to investigations and experiments to show how all the general truths of the science can be applied

to the improvement of agricultural and horticultural practice.

There is encouragement in the fact that the attention paid to botanical science in this country has largely increased in recent years. In an address delivered by Dr. Beal at the laying of the corner-stone of the new laboratory in the Agricultural College of Michigan he stated that in 1859 when he took his first degree at the University of Michigan there was but one institution of learning in the United States where a man was employed and paid for devoting his entire time to the science of botany. That man was Dr. Asa Gray, Professor of Botany at Harvard University, and at that time only eight weeks of daily work were required of undergraduate students, and they had the opportunity of electing about three weeks more. A very few resident graduates, from one to three at a time, pursued the science further. In a few other universities and colleges, botany filled a small niche in the general course of study, the same man usually teaching botany, zoölogy and geology in the course, and often, too, giving instructions in other branches of learning.

The increased interest and attention which the study of botany has attracted and which is seen in the numerous state and national gatherings of men of science where a growing number of subjects in this field are discussed in a broad and practical way by able men and women, is largely due to the work in the agricultural colleges and in the national Department of Agriculture. The work of practical botanists can be seen in numerous journals and transactions of these societies, in many books and bulletins. The place which the science of botany ought to fill in a well-conducted institution for the advance of agriculture is coming to be understood and appreciated, and Dr. Beal is right in saying that no agricultural college can rank among the best, where a professor of botany is required to teach any other subjects, and a simple enumeration of a few of the essentials of a botanical department according to his view will show how many-sided and comprehensive its equipment should be. It should have enthusiastic workers in the field, good collectors, persons well skilled in preparing plants for the herbarium. In agricultural colleges particular attention should be given to grasses and forage-plants, trees, shrubs and weeds. The herbarium should include specimens of cultivated plants, both those that are grown in orchards and vegetable-gardens as well as those that are grown for ornament. The laboratory should be supplied with so many compound microscopes that only one person should have access to the same instrument during any term; it should have microtomes, reagents in abundance, with all needed apparatus for experiments in plant physiology and for photography. It should have duplicated volumes of needed reference-books all the time in the class-room, besides a generous library. It will not be complete without a museum of plant-products and numerous greenhouses for giving different varieties of temperature, light and moisture. Beyond question, it should have a botanic garden and arboretum, where growing plants could be studied, each in the soil and exposure best adapted to it. Of course, it should have a liberal, uniformly increasing and permanent endowment, not only because a properly equipped and conducted botanic garden in itself involves an immense outlay of money, but because the botanic department of a progressive university, if it is under efficient management, will develop in all directions just in proportion to the means at its disposal.

This is a broad and far-reaching scheme, and one which we can hardly hope to see realized in the immediate future, but it is, after all, the most hopeful direction in which we can look for genuine improvement in the arts of agriculture and horticulture. No surer foundation for substantial improvement in these arts can be laid than a broader and deeper knowledge of the sciences on which they rest; and certainly the science of plant-life is chief among these. We can hardly expect that the General Government, which has been so liberal with these colleges, will

add materially to their present endowment, and we know of no way in which public-spirited men can render a higher service to their country than by following the example of Mr. Shaw, who founded the botanical garden at St. Louis. Personal fame is not the primary object of liberal citizens of this class, but in no other way could a man rear a monument more creditable or more enduring than by multiplying the facilities for instruction and research in the science of botany in its broadest sense at some of our institutions of learning, where an efficient and progressive administration of the gift would be assured.

A Reclaimed Swamp.

TO make waste places attractive is one of the self-evident duties usually neglected by the average property-owner. Our road-sides are too often covered with weeds and rubbish, and well-kept ones are local to certain communities, where an orderly sentiment has been encouraged by some energetic resident, rather than general in even the oldest settled sections of the country. But if orderly road-sides are exceptional, still more rare must be the reclamation of waste places, such as swampy lands and sink-holes, so often seen near traveled highways. That such waste lands can be made attractive by well-directed private efforts may be learned by the picture of a reclaimed swamp, whose present beauty is owing to the labors of Mr. S. C. Nash, of Clifton, New Jersey. A few years since, as has already been told in GARDEN AND FOREST (vol. v., p. 310), this tract was a low-lying swamp stretching along the main road, and covered with an ugly mass of weeds and unsightly refuse. These have been cleared, the sloping banks graded and covered with soil to smother the strong-growing indigenous plants. The low-lying portions have been widened out into basins with informal edgings, which, as will be seen, have been planted with Irises, Wild Rice, Sedges and noble Grasses. The view (page 499) having been taken from a low level fails to convey an adequate idea of the size and character of the basins which are utilized for the cultivation of Nymphæas. The water in the middle distance—at the outlet—is separated from the more ornamental basins by a low dam, which is made necessary by an occasional backing up of river-water. This section, comprising several acres, has been cleared and planted with surplus Nymphæas, and in its plainer condition is a foil to the section in the middle and left of the picture. The middle basin of about an acre, and the narrower channels leading to it, are planted with a complete collection of hardy Nymphæas, some of which have made large masses. The continual flow of spring-water having proved rather cool for tender Nymphæas, these have been provided for in tanks made by sheet-piling. These tanks are marked in the picture, and their banks masked in reality by various aquatic plants and tropical ones, of which the Musas are the most prominent in the view. Mr. Nash has grown and flowered *Victoria regia* in one of these tanks this summer. The upper section of this park (not shown in the picture) is a cleared space divided by a small stream from a wooded lot, from which issues water which has been led through quiet pools, reflecting many a pleasant picture of sylvan beauty.

One more feature of this reclamation must be noticed. If the picture were continued to the right the distance would show a most charming wild garden in the best meaning of that well-abused term. The wild garden here is not a plantation for those weeds and gross-growing plants exiled from good gardens, but is a garden which is being gradually planted in a natural way with the best native plants hardy in this latitude. It is a pleasure to walk through a wild garden planted so much in character that one comes across an Orchid, an Iris or some dainty native plant, with very much the same feeling of discovery that one experiences in finding the plant in its native haunts. This seems to me the art which is nature in such gardening.

The picture on page 499 is a view of one section of the middle basin, and conveys an excellent idea of effective plantings at the edge of the water and a beautiful shoreline. It, at the same time, is a beautiful illustration of *Nelumbium speciosum*, showing its natural habit in all stages and its effectiveness in a clear pool with ample water space. Here may be seen the leaf floating at the surface of the water, as happens when growth is first made, and other leaves in all stages, from the tiny arrow-head-like coil to the broadly undulating, perennially interesting, fully expanded specimens. Even in the picture they show the various tones of light which render them so attractive. The rambling habit of the plant is well illustrated in the detached smaller groups, which are from creeping stolons of the main growth. Many illustrations of this Lotus have been published which are not true to nature; this picture, therefore, showing its true character must prove interesting.

Mr. Nash's garden, it will be seen, is bounded at the left by the public road, from which it is in full view and easy of access, so that, while it is a private garden, it is practically a public park, open to all, and an improvement which would be welcomed in any locality. Such an example as this seems worth imitation. There are many such spaces whose reclamation would furnish interesting occupation for those fond of nature, aside from the public benefit given.

A FINE consignment of Palms and Tree-ferns recently left Boston for Chicago, the plants being gifts to the Horticultural Department of the Fair, where, under the big dome of the fine building beside the lagoon, it was thought best to establish them before frost set in.

From the Harvard Botanical Garden went two specimens of *Livistonia Sinensis*, which are about twenty years old. For a number of years their growth was retarded by the use of small pots, but when they were planted out in the new Palm-house of the Botanic Garden they grew with surprising rapidity. Their height is now thirty-four feet to the top of the tallest leaf, while at the base of the stem they girth six feet, and the fan-shaped leaves, about fifty in number on each plant, are between five and six feet long. The third contribution of the Botanical Garden is a *Seaforthia elegans* about twenty-four feet in height, with a clean smooth stem up to half this height, and leaves about ten feet in length.

From his famous gardens at Wellesley, Mr. H. H. Hunnewell sent a fine Tree-fern—a *Dicksonia regalis*, with a stem about five feet high and thirty inches in circumference; a *Pandanus reflexus* eighteen feet in height, with fifty-five leaves, each about eight feet long; a *Cocos Bonnettii* eighteen feet high, with thirty fronds, which spread so widely that it will require a place more than fifty feet in diameter for its exhibition, and two specimens of *C. coronata*, each twenty-four feet tall. All these specimens, we are told, had been growing in Mr. Hunnewell's conservatory for at least twenty-five years.

The consignment was completed by three trees from the private greenhouse of Professor Sargent. These are a *Kentia Wendliana*, about ten years old, which was raised from the seed by Professor Sargent; a *Chamerops excelsa*, forty years or more of age, which is sixteen feet tall and spreads ten feet, and a *Phoenix reclinata*, nearly thirty years of age, which measures about fourteen feet in height and as much in spread.

Carefully packed, these admirable plants filled two cars, and as soon as they reached Chicago were to be set in place beneath the great roof, where they will have such a chance as never before to develop as rapidly as they choose. This chance will probably be particularly welcome to the two Bourbon Palms from the Botanic Garden, as, during last winter, they broke the glass above their heads several times, and when the weather became warm enough for a renewal of the glass to be needless, promptly grew six feet in the open air.

The Supposed Correlations of Quality in Fruits.

AT the Rochester meeting of the American Association for the Advancement of Science, Professor L. H. Bailey read a paper on this subject, the greater part of which we herewith reproduce :

High quality in fruits, by which we mean that combination of fine texture, tenderness and pronounced agreeable flavor which renders them fit for dessert, is supposed to exist at the expense of some other character. The best fruits are thought to be tender in tree, unproductive, to lack vigor, or to be small or dull in color. This notion is one of the dogmas of horticulture which has passed down from generation to generation unchallenged, and it is the parent of the common assumption that a first-rate market fruit is almost necessarily one that is indifferent or poor in quality. The correct understanding of this general belief lies at the foundation of all advance in horticulture, for if variation in quality is always correlated with variation in some other character, we should be able to breed directly for quality by means of simple selection, taking seeds, for instance, from the tenderest tree or the least productive, to secure the highest quality in fruit. But we must first determine if the law of Goethe and St. Hilaire, that the sum of activity in any plant is fixed, with variation occurring only within the limits, is true, or if we can force the plant beyond its original bounds, and increase the sum of its activities. We must determine if the independent variation of organs which Wallace has found to exist in nature, obtains also in the garden, or if, once inside the garden-fence, the plant assumes a law of development in parallelisms. It therefore becomes a philosophical question.

Now, there are about seven characters which are commonly held to be correlated with marked increase in quality, three of which belong to the fruit itself, and the remaining four to the plant as a whole. These are: Decrease in size or seed-production or loss of high color in the fruit, tenderness, lack of vigor, short life or unproductiveness in the tree.

There are two methods of discussing my subject, the statistical and the philosophical. Fortunately, statistics are at hand for our purpose. I have selected as the basis of my investigations the well-known fruit-catalogue of the Michigan Horticultural Society. This is almost wholly the labor of T. T. Lyon, whose discriminating judgment upon the merits of fruits is not excelled in this country. In this catalogue all the varieties are graded upon a decimal scale in three distinct categories—dessert, cooking and market. Each variety is also rated in size and color. Mr. Lyon's standard of excellence in quality for dessert is high, and only the very choicest varieties reach figures nine and ten. It therefore offers an opportunity for the selection of extreme types and the elimination of all such intermediate ones as would be likely to complicate and obscure the results. The catalogue is also extensive enough to afford a safe basis of estimate; it contains 219 varieties of Apples, seventeen of Blackberries, fifty-two of Cherries, sixteen of Currants and Gooseberries, forty-seven of Grapes, seventy of Peaches, sixty-three of Pears, thirty-four of Plums, thirty of Raspberries and sixty-one of Strawberries.

I have examined for comparison the records of the size and color of all those varieties which scale nine and ten for dessert. There are thirty-eight varieties of Apples graded nine and ten, of which only three are rated small, while seven are large and two are very large. Those rated as medium to small are two, and those medium to large are three. Of these thirty-eight entries, therefore, six, or less than one-sixth, would be called small apples, and thirteen, or over one-third, are large apples, the remaining ones being classed as medium or intermediate. In other words, there are over twice as many large apples as small ones of very high quality in this list; and there is every reason to believe that what is true of the 219 varieties here considered is also approximately true of all varieties in cultivation, for the list contains a very large proportion of the total number of varieties of high quality. Of the seven Blackberries rated nine and ten, five are large, one is medium and one is medium to small. Of the sixteen best Cherries, eight are large, two very large, one medium to large, and none of them are small. Of the three Currants, one is large and the others are medium, and the two Gooseberries are large or medium to large. Among the eight best Grapes, there are three large-bunch varieties and one small-bunch. Of twenty-one best Peaches, none are small, twelve, or over half, are large, two are very large, and one is medium to large. Among twenty-one best Pears, five, or nearly a quarter, are small, three are medium to small, while six are large and two are medium to large. In this instance, the numbers of large and

small are equal. In the six best Plums, but one is small. Of eight Raspberries, none are small, but four are large and two are very large. In the twenty-three best Strawberries, none are small, while six are large, and eleven, or nearly one-half, are very large.

There can be but one conclusion from these figures, and that is that quality is not associated with size of fruit. If the figures were to be interpreted as they stand, it would appear that increase in quality is usually associated with increase in size, but it must be remembered that small fruits are less likely to be propagated extensively than are large ones. It is only when small fruits possess some superlative merits, as in the case of the Early Joe Apple and the Seckel and Summer Doyenne Pears, that they are worth cultivating in competition with larger fruits. And thus it would be useless to attempt to draw any conclusions from the listed sizes of poor apples, for poor small apples are not often perpetuated. We need not resort to figures to show that increase in quality is not a necessary attendant of decrease in size. Every fruit-grower who stops to reason upon the question must recall the fact that "seedling" Apples are usually small and very poor in quality. The fallacy of associating size and flavor, as of other supposed parallelisms, arises from the fact that individual instances have been widened into generalizations. We wonder at the smallness of the Russets, the Early Joes, the Delawares, the Seckels and the Doyennes, but we forget the Fall Pippins, the Hubbardstons, the Spys, the Greenings, the Brightons, the Anjous and the Boscs. But if it is a fallacy to associate increase of quality and decrease of size, it is perhaps a greater one to associate high quality with low color. A study of the preceding tables shows that red is a very prominent character in all the fruits, and wholly green fruits, even among the apples, are rare.

In many varieties the seed production has decreased, and it has been held by some that there is a correlation between it and quality. The chief exponent of this hypothesis is Dr. E. Lewis Sturtevant, who outlined his views before the American Pomological Society at its last Boston meeting. He has made a fuller discussion of the subject in a recent paper, in which he asserts that "there seems to exist in fruits a correlation between seedlessness and quality, especially when that quality is expressed by the term tenderness of tissue. In fruits of fine quality, tenderness of the seed-coating often seems a marked characteristic, as in grapes, where the seeds of the improved varieties are distinctly softer and more brittle than in those of the wild species; as in peaches and plums, where the tendency of a split stone is often noticeable in fruit of varieties of high quality." I have made no studies concerning the strength or thickness of seed-walls in cultivated fruits, but I do not doubt that there is a general tendency toward fragility. But I cannot look upon this tendency, if it exists, as in any way related to quality. It is undoubtedly due to constant selection for small-seeded fruits. Concerning the relations of seed-production to amelioration, I have made some careful studies. I have found, as a rule, that the cultivated varieties of Apples contain more seeds than the wild European Crabs. Forty specimens of fruit of these Crab-seedlings contained a total of 256 seeds, or an average of six and two-fifths seeds to the fruit. Forty Northern Spy apples yielded four hundred and eighty-one seeds, or an average of over twelve to the fruit. Normally, the apple contains five carpels, and each carpel contains two seeds, but some of these Spys had fifteen seeds and one had eighteen. And yet the Northern Spy ranks ten in Mr. Lyon's dessert scale. I had all the seeds counted in a pound of each of thirty samples of tomatoes, representing twenty-six varieties of very different degrees of amelioration. The lowest comparative seed-production was in the Cherry Tomato, which is very near the wild type. There was found to be a general, but uncertain, increase in seed-production as the variety departs from the Cherry Tomato, but this increase bears no relation whatever to the extent of departure. Now and then an orchard-fruit appears which is almost or wholly seedless, but it is not necessarily of high quality. So-called coreless apples and pears occasionally appear, but none of them have ever had sufficient merit to warrant their extensive propagation. Barren mentions two no-core apples, one of which is recommended only for kitchen use, and the other is characterized as worthless. I do not wish to discourage the sowing of seeds from few-seeded fruits, for the practice is probably a means toward still further eliminating seeds, but I see no reason to expect any unusual increase of quality from this source. Seed-production appears to me to be subject to the same laws of variation as other attributes of plants, and it appears independently of other characters, in the same manner as size and color.

In comparing the habit and vitality of the tree in the best varieties with the poorer ones, it must be borne in mind that a tender, or weak-growing, or unproductive tree which bears poor fruit is unfit for cultivation, and such varieties do not often appear in the fruit lists. But, on the other hand, such trees are often cultivated because of some superior quality of the fruit. So it happens that the poorest trees and least productive ones described in our manuals are apt to produce fruits of the highest quality, and growers are apt to enlarge this circumstance into a generalization. But, the fact that Winter Nelis is a poor grower, that the Delaware Vine is slender and particularly liable to mildew, and that the Newtown Pippin is unreliable, is many times overbalanced by the vigorous growth and productiveness of Anjou, Catawba and Northern Spy and many others. In fact, a study of the dessert fruits in this catalogue will show that over eighty per cent. are hardy, vigorous and productive. In regard to the notion that the best fruits are usually short-lived, I have only to say that there are positively no facts to support it.

It is also generally believed that market fruits are either poor or indifferent in quality, but here again facts do not warrant the belief. It must be remembered that many of the best dessert fruits are cultivated solely for the sake of the one character of high quality, while the best market fruits are cultivated for a variety of features, as size and color of fruit, vigor, hardness and productiveness of the tree, and quality is usually not considered. Market fruits and dessert fruits are not, therefore, strictly comparable. But if there are any good market fruits which are at the same time good dessert fruits, we shall be obliged to admit that market qualities and table qualities are not incompatible. Of the 219 varieties of apples catalogued by Mr. Lyon, nineteen are rated nine and ten for market. Of these, six, or about one-third, also rate nine and ten for the dessert, as follows: Golden Russet, Hubbardston, Jonathan, Northern Spy, Peck's Pleasant and Rhode Island Greening. Of these six, four rate the same for both table and market and two rank one higher for market than for table. Moreover, there are four other varieties which rank as high as eight in quality, which is two points higher than the Baldwin. Of the ten best market blackberries, four are included in the select dessert lot. Fourteen cherries rate nine and ten for market, and just half of them are in the select list. Of the eight best market currants, however, only one is rated high for dessert, but the currant has not been developed in the direction of high quality. Of the four market gooseberries, two are in the other list. Mr. Lyon admits but six market grapes, of which one is a superior table fruit. Of the market peaches, nearly one-fourth are dessert fruits. One-fourth of the market pears rank highest for dessert, while one-third of the remainder rank as high as eight, which is the rating of the Bartlett and Sheldon. One-seventh of the best market plums are best for dessert, and nearly a third rank eight. Of the dozen best market raspberries, one-fourth are best table sorts, while half of them rank eight. Over a third of the market strawberries are dessert varieties. All these facts show conclusively that high quality is not incompatible with that combination of characters which makes a fruit good for marketing, and they show that a very large proportion of our market fruits actually are dessert fruits. And if we take the average quality of all the fruits ranking nine and ten for market we find it to stand uniformly at seven or above for dessert, or higher than medium quality. Thus the average table rating of all the high market apples is 7.1, or over one point higher than the Baldwin. The average of the market blackberries is 8.5. This instance is particularly interesting, because the blackberry is probably the fruit oftenest cited as decreasing in quality in proportion as it is increased in size. Cherries average 7.3, and grapes 7.8. Peaches average 7.6, which is higher than the rating of Late Crawford, Barnard and other standard sorts. Market pears stand at 7.7, or higher than Angouleme, Flemish Beauty, Superfine and Louise Bonne. Plums average seven. Raspberries give an average of 7.8. Strawberries are eight, which is the rating of Kentucky, Miner, Ohio, Sharpless and Charles Downing. It is impossible to construe these facts to mean anything else than that all desirable characters of fruits may progress simultaneously.

In this connection we should discuss the popular notion that the berry fruits decrease in quality when they are brought into cultivation, because the decrease is supposed to be due to increase of size and vigor. Most people think of the wild strawberries and blackberries of youthful rambles as possessing unusual sweetness and aroma; and I do not doubt that it is true, even allowing for the exaggeration of retrospect, that wild berries are sweeter than those which we commonly obtain from the garden. But I know of no reason for believing that

wild fruits are actually sweeter than tame ones. I am convinced that it is mostly a question of ripeness. To be sure, there may be cultivated varieties inferior in quality to some wild berries, but, as a rule, I do not believe that cultivation has had the effect of decreasing quality. I have given particular attention to this question this year with blackberries, which are very generally considered to have lost sweetness by transfer to the garden. Among garden varieties I have studied Agawam, Early Cluster, Early Harvest, Ancient Briton, Snyder and Stone, and two of these are rated as low as eight for dessert by Mr. Lyon, while the poorest varieties go only as low as seven. In the study of wild berries, I visited a region which I had known in boyhood, and which I have always remembered because of its great and luscious blackberries. But the comparison was greatly in favor of the tame berries if they are allowed to remain upon the bushes until ripe. In the wild patches we practice an unconscious choice, and pick only those berries which please us. We pick the ripest and the best. It is noticeable, also, that we pick the largest, and base our judgment upon them, while we should find the best quality in the smallest berries if our assumed logic is sound. Cultivated berries, when marketed, are necessarily picked before they are ripe, and they never reach their full quality. And even when picked for table use, blackness in the blackberry and redness in the strawberry are usually considered as measures of ripeness. But the true measure of ripeness is softness. A well-grown fully ripe blackberry, which falls into the hand when the cluster is shaken, possesses a tenderness, juiciness and sweetness which I have rarely found in a wild berry. And the same is true, in my experience, of strawberries and raspberries.

But we do not need to rely upon individual tastes, for all chemical examinations which I have been able to find show that sweetness increases with the increase or intensification of culture. This would seem to be almost necessarily the case, because the ultimate aim of cultivation is to supply more food to the plant, and this food in fruits is largely potash, which bears a definite ratio to sugar. Dr. Stone reports a series of interesting experiments in this direction at the Massachusetts Agricultural College. "A wild specimen of *Vitis Labrusca* (our common Wild Grape) was torn apart at its root; one-half was left in its natural condition, the other transplanted to cultivated ground and treated with nitrate of potash and bone superphosphate. At the end of three years fruit from the cultivated vine contained twelve per cent. more potash and twenty per cent. more sugar than that from the wild one." Analysis of wild and cultivated strawberries showed a great increase in potash in the cultivated variety. "But the change was not confined to the mineral elements alone, for the same analysis showed that the proportion of sugar to acid in the wild species is as two to one, while in the cultivated varieties it is increased to six to one or more." Dr. Stone further declares that "potash fertilizers have decidedly improved the desirable qualities of fruits. Wherever the percentage of this element has been raised, the change is accompanied by an increase of sugar and decrease of acid." Dr. Stone has made a subsequent examination of the chemical composition of strawberries at the Tennessee experiment station, and he finds that, "in the varieties examined, the proportion of acid to sugar was 1 to 3.5. For the wild strawberry, the only references available, and these very meagre, show a corresponding proportion of 1 to 2. This indicates that a change for the better has been made, but it is far from probable that the limit has been reached." Fresenius gives the sugar in cultivated strawberries as 7.5 per cent., and the free acid as 1.13, and in the wild berries as 3.2 and 1.6 per cent. respectively. Cultivated raspberries, according to the same authority, contain 4.7 per cent. of sugar and 1.3 per cent. of acid, while wild ones contain 3.5 per cent. of sugar and 1.9 of acid. Parsons finds that sugar increases rapidly in oranges as they depart from the wild type, although free acids do not show a corresponding decrease. Thus the wild bitter-sweet of Florida contains .84 of cane-sugar and 5.71 of glucose; the sour, .97 cane-sugar and 3.36 glucose; the common oranges, 4.38 and 4.60 respectively; russets, 4.51 and 7.29; mandarin, 8.07 and 4.77. The figures and experiences uniformly show that amelioration in other qualities is accompanied by an increased sweetness; and every one who has tested seedling or wildling fruits can bear testimony to the same fact.

But if all statistics show that high quality does not proceed at the expense of other characters, practical experience in the origination of fruits shows it as well. As a matter of fact, seeds of small or low-color fruits, or from tender or unproductive varieties, do not give a larger proportion of varieties of high quality than seeds from large, highly colored and vigorous kinds. And it is here worthy of remark that while most

pomologists hold to the correlation of quality with decrease of other characters, they at the same time uniformly recommend that in producing new varieties only seeds from the largest, finest and hardiest varieties should be used.

It is evident from our discussion that quality and other characters of cultivated fruits appear independently of each other; that there is no true correlation between these characters. There is a general increase in all characters as amelioration progresses—at least in all characters which are particularly sought by horticulturists; and this fact must ever remain the chief inspiration to man in his efforts to ameliorate plants.

New or Little-known Plants.

New Orchids.

CYMBIDIUM HUMBLOTTII, Rolfe.—A fine Madagascar species, the second now known from that island, with a large branching panicle of green and black flowers, which resemble those of *Cœlogyne pandurata*. A plant was exhibited at a meeting of the Royal Horticultural Society on June 7th last by C. Ingram, Esq., of Godalming, and was awarded a botanical certificate. Dried specimens were sent home by Monsieur Humblot, and it is highly probable that the living one came from the same source.—*Gardeners' Chronicle*, July 2d, p. 8.

ONCIDIUM ROLFEANUM, Sander.—A New Granadan species allied to *O. Kienastianum*, Rchb. f., and *O. trilingue*, Lindl. It was introduced by Messrs. F. Sander & Co., of St. Albans, who exhibited it at the last show held by the Royal Horticultural Society in the Inner Temple Gardens, when it was awarded a botanical certificate.—*Gardeners' Chronicle*, July 9th, p. 34.

PHALÆNOPSIS × *ARTEMIS*, Hort.—A pretty hybrid raised from *P. grandiflora* crossed with the pollen of *P. rosea*. It bears some resemblance to *P. × intermedia*. It was exhibited by Messrs. James Veitch & Sons, of Chelsea, at a meeting of the Royal Horticultural Society on July 12th last, and received an award of merit.—*Gardeners' Chronicle*, July 16th, p. 75.

DENDROBIUM CHRYSOCEPHALUM, Kranzlin.—A species belonging to the section *Pedilonum*, with golden-yellow flowers very similar to those of *D. viridiroseum*, Rchb. f., in shape. It was introduced by Messrs. F. Sander & Co., of St. Albans, and flowered in the collection of Prince Lichtenstein, of Moravia.—*Gardeners' Chronicle*, July 30th, p. 122.

MASDEVALLIA HARRYANA GRAVESIÆ, Rolfe.—A pure white variety of this handsome species, and exceedingly rare. It was introduced by Mr. F. Mau, of Orange, New Jersey, and flowered in the collection of Henry Graves, Esq., of the same place.—*Gardeners' Chronicle*, July 30th, pp. 122, 131, fig. 21.

CYPRIPEDIUM × *BRYANI*, Hort.—A very handsome hybrid raised from *C. Philippinense* crossed with the pollen of *C. Argus*, in the collection of N. C. Cookson, Esq., of Wylamontyne. It received an award of merit from the Royal Horticultural Society on July 26th last.—*Gardeners' Chronicle*, July 30th, p. 138.

Kew.

R. A. Rolfe.

Foreign Correspondence.

London Letter.

NEW ORCHIDS AT THE SALE-ROOMS.—There is an inundation of new or so-called new Orchids in the English market now, chiefly in the London auction-rooms. Collectors display more energy than ever in sending home large quantities of plants, with tempting descriptions of the beauties of their finds and graphic accounts of the terrors and trials they had to undergo to procure them. The old style was quite different. The collector was a secret worker, his movements were unknown to all save his employer, and if he suffered much there was little said about it. Now every importation has a history, an attractive one, and "our collector" tells of the cannibals, venomous serpents, ferocious animals, treacherous servants, etc., etc.,

which he had to encounter in his search for the plants which are now offered at any price you like, only please note there are no more because "our collector" says he has gathered every one or an earthquake came and swallowed all that he left. The perils of the "Orchid hunter" have already been the subject of a serial story in an English weekly. Meanwhile there is no difficulty in getting men to go on these perilous errands, and as a rule they thrive wonderfully well, spite of serpents and cannibals.

This "romancing" does no harm, indeed it is often interesting. One wonders how far the collector will go in his desire to spin a yarn, which is meant, we suppose, to inspire rival collectors with fear. Mr. Grant Allen recommends any one who has thoughts of taking up literature as a profession to buy a broom and sweep crossings instead. The plant collector now talks in the same strain. Meanwhile thousands of pounds are spent on Orchids now where tens were spent before. There is certainly no sign of abatement in the Orchid fever.

CYCADS.—The collection of Cycads at Kew is the richest known. It comprises many very large specimens, some of which frequently produce very fine cones. There are more cones than usual just now, the following being specially noteworthy: *Dioon pectinatum*, a newish species, previously called *D. spinulosum*. It differs from *D. edule* in having broader, thicker pinnæ, toothed near the apex. The cone, a male, is one and a half feet long by four inches in diameter. *D. edule* is also in fruit, the cone, a female in this case, being as large as a man's head. *Encephalartos villosus* has two beautiful cones rising from the centre of a grand rosette of arched leaves eight feet long. Each cone is one and a half feet long, half a foot in diameter, and built up of regular angular fleshy scales colored soft orange, not unlike a huge pine-apple. When the scales open and partly show the rich scarlet seeds the effect is particularly attractive. *E. Altensteinii*, the giant of the genus, has a head of leaves fifteen feet through. It is a grand plant for a large house, grand as any plant I know; moreover it is as good-natured as a *Dicksonia*. There are several very large specimens of it, one or other of which is always in cone. There are a pair of male cones eighteen inches long on one of them now. *Macrozamia spiralis* has a short conical stem two feet in diameter and long flaccid leaves of a rich green color. The one in cone now has no less than six fine male cones, each nine inches long and colored pale greenish yellow. There is not much difference in habit between this and *M. Fraseri* and *M. Moorei*. Another of the same stamp, named *M. Dyeri*, has recently been added to the Kew collection.

These large sturdy Cycads are most valuable plants for furnishing large houses. They are always good to look at, magnificent in every sense, and they are, as a rule, among the easiest of plants to cultivate. Large stems of them may be sent long distances without suffering, most of the big specimens at Kew having been obtained from Australia or Africa by means of stems dug up and sent without any soil in dry boxes. Some years ago a large stem, ten feet long, of *M. Moorei*, which had been sent from Australia by Sir F. von Mueller, showed signs of decay at the base of the stem. To save it the stem was cut in two and the upper half planted as a cutting. It rooted in time, and is now a fine healthy specimen. The South African Cycads, such as *Encephalartos villosus*, *E. Caffer* and *E. Altensteinii*, ought to thrive in the open air in such states as California.

STEVENSONIA GRANDIFOLIA.—This is a Palm of more than ordinary interest. It is a native of the Seychelle Islands, where it is said to be common, but, as is the case with several other genera found in those islands, it does not occur in any other part of the world. It is monotypic. It grows to a height of fifty feet, and has a slender, annulated, unarmed, dark brown stem, the upper part of which is clothed with the hard sheathing bases of the leaves. Young plants have numerous black spines an inch long on the leaf-stalks, but as the plant increases in size these

spines gradually disappear. The leaves are large, cuneate-obovate, bifid at the apex, with marginal divisions or segments, which are notched at the tip. The blade is rich green, margined with orange and blotched with reddish brown. In very young plants the orange-colored petiole, midrib margin and blotches of the leaves are really ornamental.

For the discovery of this Palm we are indebted to Mr. Duncan, once a young gardener at Kew and afterward curator of the botanical garden at Mauritius. He found the Palm in Round Island in 1855, and sent three seedlings of it to Kew. He named it in compliment to the Governor of Mauritius, who did much to assist Duncan in his botanical work. One of the three seedlings disappeared from Kew in 1857 and reappeared in a Continental garden in 1857, a circumstance which led Wendland to name the

the Seychelles and the decidedly beautiful character of the young plants. Like all, or nearly all, the Palms from the Seychelles it requires a tropical stove temperature and plenty of moisture all the year round. It is peculiar in being so very spiny when small, and spineless when large; it is also remarkable in the rusty red blotches on its leaves, which might easily be mistaken for the marks produced by insects; indeed, I have heard of a plant being condemned by the judges at a flower-show on account of these "unhealthy" spots.

Other Palms, which are endemic in the Seychelles and monotypic, are *Verschaffeltia*, *Roscheria*, *Nephrosperma* *Deckenia* and *Lodoicea*, the double Cocoa-nut. These are all in cultivation at Kew and in other gardens where Palms are in favor.

London.

W. Watson.



Fig. 84.—Part of a Reclaimed Swamp, near Clifton, New Jersey.—See page 494.

plant *Phœnicophorium*, or Stolen Palm, a name by which it is still known. Another of the seedlings died, but the third still remains, and is now one of the handsomest specimens in the Palm-house. It is thirty feet high, with a stem nine inches in diameter and eleven fine leaves, each with a curved, channeled petiole four feet long, and a broad entire blade seven and a half feet long by five feet wide. This plant is now flowering for the first time. The inflorescence is at first enclosed in a club-shaped woody spathe three and a half feet long, which splits longitudinally and falls off, exposing a branched panicle a yard long clothed with bright yellow flowers. As the plant is monœcious, it will probably produce a crop of fruits. A figure of it has been prepared for the *Botanical Magazine*.

Stevensonia, or *Phœnicophorium*, is rare in cultivation, notwithstanding that the seeds are easily procured from

Cultural Department.

Grafting Grapes.

IN the vineyard districts of New York, the matter of Grape-grafting is becoming an important one for the growers. Many vineyards which are now in bearing consist of varieties which, when planted, promised abundant returns. But all the promise was not fulfilled to the satisfaction of the grower. There are many men who would be glad if their vineyards were bearing other varieties of grapes than those now produced, and the question whether these vines could be grafted with the desired varieties has been discussed with considerable earnestness. The Cornell Experiment Station has undertaken to throw some light upon the matter, and during the past spring several methods of grafting the Grape were tried. Some of the methods which give the best results in Europe were followed as well as some which are not in common use.

Although the season's work shows some marked failures, still the lines in which future work should be carried on are quite clearly defined.

About twenty vines of the Red Wyoming Grape were used for each kind of graft, and cions of the Niagara were inserted. With one exception, the cions were about ten inches long and

ordinary cleft graft. The stock was cut off about three inches above the ground, and after the cions were inserted all cut surfaces were covered with grafting wax. None of the cions lived.

(2) The same method was again adopted, but the wounded portions were protected with a thick layer of clay and cow-



Fig. 85.—The Sacred Lotus in a Reclaimed Swamp.—See page 494.

carried two or three buds; the stocks were six years old. The work was done April 4th, the weather at the time being quite warm and the sap was flowing freely. The following is a brief outline of the various methods used and the results reached:

(1) In this case the cions were inserted in the stock by the

manure, mixed in equal proportions. This dressing is said to be of much value in Grape-grafting, but in this case its virtues were not manifest. All the cions died.

(3) This method is called by Baltet side-grafting with an oblique cleft. A slanting cut is made downward on the side of the stem, at any desired height, but the knife is drawn

down much further on the side toward the handle. Into this oblique cut a wedge-shaped cion is inserted and tightly bound. No wax was applied. None of the cions grew.

(4) The operation was performed as described in 1, but the stock was cut below the surface of the ground and just above the highest roots. All cut surfaces were covered with common grafting wax, after which the earth which had been removed was replaced. This method gave better results, for about sixty-one per cent. of the cions made a fine growth.

(5) The work was done as in 4, but no wax was used. Sixty-eight per cent. lived.

(6) The stock was cut below the ground, as in 4. Two longitudinal V-shaped cuts, about one and one-half inches long, were made upon opposite sides of the stubs, and the cions were cut so that they fitted into these grooves as neatly as possible. They were then securely tied, but no wax was applied. In the fall, eighty-six per cent. of the stubs carried vigorous canes.

(7) The stock was prepared as in 4. Upon one side of the stub the bark was cut away, so as to leave a flat, smooth surface about two inches long and half an inch wide. The cions were cut about eighteen inches long, and eight or ten inches from their upper extremities a cut similar to that in the stock was made, only it was not so wide. The two cut surfaces were pressed together and firmly tied, the lower extremities of the cuttings being buried in the soil. This method gave the best results, for fully ninety-three per cent. of the stubs (or the cuttings) carried canes in the fall. The growth was much stronger than that made by ordinary cuttings, for in some cases it aggregated fully seventy-five feet.

From these experiments it would appear that the best place to graft Vines is under ground; whether wax or any covering other than earth is beneficial still remains to be determined. In these experiments the wax did not seem to do very much good. If the cions were inserted by the cleft graft and almost buried with earth, excellent results would probably be obtained, and this method can be most safely recommended. Methods 6 and 7 may even be better, but the operations are more tedious.

The French have not contented themselves with using only mature wood in grafting the Grape; they have given much attention to this subject, and some advise the use of soft wood. The following extract from an article by René Salomon, which appeared in *Vigne Americaine*, will give a fair idea of the manner in which this work is done:

"Herbaceous grafting is very easily performed; in half an hour a novice can become so skillful in the operation that from eighty to ninety per cent. of the grafts will be successful, provided: (1) That the vine is in its most active period of growth; (2) that the weather is sufficiently warm (at least sixty-five degrees, Fahrenheit); (3) that the shoots used are sufficiently strong, and neither too hard nor too soft; they should still be flexible, yet the centre should be free from pith; (4) that the cions are placed beneath the fourth bud from the extremity of the shoot; (5) that the cions contain at most only two buds. After being cut they should be kept a few days in damp fresh grass, and they are then ready for use. In fact, the most essential condition for success is the more or less herbaceous condition of the cion and the stock."

The splice-graft is the method recommended by Salomon. He advises making the oblique cut through the centre of the nodes, both in the cion and in the stock. The cuts are made as nearly the same as possible, and the two pieces are then firmly tied together with a rubber band, for this is preferable to raphia, on account of its elasticity. After the operation the graft is protected from the sun and rain for about ten days, by simply rolling a grape-leaf about the place of union. In four weeks the rubber may be removed, for at that time from two to three inches of growth should have been made by the cion.

Cornell University.

E. G. Lodeman.

The Herbaceous Garden.

AS yet, although it is almost mid-October, there has been no frost to cause serious injury to outdoor vegetation. The Golden-rods and native Asters are still quite gay with flowers, and some of the other native plants are equally effective, although they are not so common or well known. The Boltonias, for instance, are free-growing plants of graceful habit, flowering profusely in August, September and October. They resemble the Asters closely, but they are of a more vigorous character, with large, smooth, lanceolate, pale green leaves. *Boltonia glastifolia*, said to be a form of *B. asteroides*, attains to a height of about six feet, and it is the first to bloom. The heads are about an inch and a quarter in diameter, the

ray florets being either pure white or of pale purple color, and those of the disk yellowish. *B. asteroides* flowers much later, and is now a fine mass of bloom. This, indeed, from the gardener's point of view, is the only material difference between it and *B. glastifolia*. The flowers of *B. latisquama* are to be seen side by side with those of *B. asteroides*, but this plant is only about four feet high, and it has smaller and narrower leaves than the latter. The heads, however, are much larger, being somewhat over two inches across, and the rays are bright purple. These three plants are perhaps the best of the genus for garden purposes. They grow well in ordinary soil, and are easily propagated from seeds or by division of the clumps in spring.

The Vernonias, commonly called Iron-weeds, are conspicuous for their dense cymes of dark purple heads. The flowers are perfect, and thus the individual heads have the appearance of double Daisies. *Vernonia altissima* is about eight feet high, leaves oblong-lanceolate, serrate, cymes very dense, and the flowers are at their best in August and September, the heads measuring almost two inches across. *V. noveboracensis* is very much like the last-named species. The leaves, however, are a trifle narrower, their serratures less prominent; the heads smaller, of lighter color, and developed in September, lasting into October, and the cymes are loose. *V. arkansana* blooms at the same time as *V. noveboracensis*; the heads and cymes are likewise similar, but the leaves are linear-lanceolate and denticulate. Vernonias and Boltonias make satisfactory progress under the same treatment, and they are propagated under the same methods. They look well in shrubbery plantations, and the flowers are admirable for cutting.

Each succeeding autumn adds to the popularity of the double-flowered varieties, *Plenus* and *Soliel d'Or*, of *Helianthus multiflorus*. They are as useful as *Chrysanthemum* or Dahlias, with the advantages over those plants of perfect hardiness and a rigidity of the flower-stems, which would be a vast improvement to the latter. They are about four feet in height, and the growth is free and compact. There are few better decorative plants, as they bloom freely from early autumn until cut down by severe frost. The flowers have no superior for cutting purposes, and they are more valuable because they will last two weeks in perfect form and color if cut soon after full development and given proper attention in the matter of water. The florets of *Soliel d'Or* are all large, but in *Plenus* those of the outer circle are more conspicuous than those of the centre. I prefer the more uniform structure of the flowers of the first-named, but both plants are eminently desirable. They are well adapted for town gardens, growing and flowering freely in almost any soil or situation, and they are readily increased by division. It should not be forgotten, in speaking of varieties of *H. multiflorus*, that *multiflorus* itself is merely a garden name for a form of our native *H. decapetalus*.

Cambridge, Mass.

M. Barker.

Roses.

APPARENTLY the most interesting among the newer Roses at the present time is *Madame Caroline Testout*. Many of the large trade-growers have already spoken in praise of this hybrid Tea, and the supposition now is that the new-comer will usurp the leading position among pink Roses so long held by *La France*. The flowers of *Madame Testout* are very large, and of a specially pleasing shade of pink; this color extends to the outer petals also, a quality not found in *La France*. As far as known at present, it is a strong-growing variety, producing fine foliage. As a rule, the buds are solitary, this also being a point in its favor, as disbudding is thus made unnecessary. As an indication of the anticipated popularity of this Rose, it is stated that a single selling-agent has secured control of a stock of 20,000 young plants for distribution next spring.

Another new Rose to be distributed next spring is the pink sport from *American Beauty* that originated with Mr. John Burton, of Philadelphia. This certainly seems to be an improvement on its parent, being equal in size and fragrance, and of a beautiful shade of pink, the color far superior to the dull hue so often seen in *American Beauty*, and especially after this Rose has been cut for a day. The sport retains its brightness for quite a length of time after being cut, and will undoubtedly prove a more satisfactory flower for the retail florists to handle. In token of his confidence in the good qualities of the Rose in question, Mr. Burton proposes to distribute the flowers in the regular course of trade this winter, thus allowing those interested a good opportunity to examine and compare the new Rose with its parent and other varieties

before purchasing plants in the spring. It may also be noted that as yet this sport has not been named, so that it cannot be more definitely spoken of than "Burton's sport from American Beauty."

Among indoor Roses in general this is one of the critical periods of the year, from the extreme liability of some varieties to contract mildew. Proper attention to watering, ventilation and heating, with applications of sulphur, removes this trouble readily. Probably the best method of applying the sulphur is by means of a bellows, after which the house should remain closed for a time in order to allow the fumes to operate on the fungus, keeping in mind the fact that if the temperature is allowed to run up above ninety degrees there is much risk of injuring the Roses.

The night temperature of a rose-house is rather difficult to regulate at this season without very careful firing. Fifty-eight to sixty degrees is the most satisfactory temperature for a majority of the varieties in general use, while special varieties may need either higher or lower than this average.

Difficulty is usually experienced in successfully growing a considerable number of different varieties in one house, but I recently saw a house in which were Papa Gontier, Catherine Mermet, Bride, Niphotos, Madame Hoste, Perle des Jardins, W. F. Bennett, Souvenir of Wootton, Madame Cusin and Madame de Watteville, and the grower informed me that the only varieties he had any trouble with were Bennett and Wootton; at the time I saw them even these were in nice condition.

The method of staking Roses, to which reference has several times been made in GARDEN AND FOREST, continues to grow in favor—that is, the plan of using galvanized steel wire rods in place of wooden stakes. These are kept upright by securing them at the top to a longitudinal wire attached to the roof of the house. The galvanized steel wire is very durable, does not require any painting, and forms the neatest possible support for the plants. It has in addition the merit of cleanliness, for it does not harbor vermin, as is frequently the case with wooden stakes. The canes that have frequently been used for this purpose form admirable hiding-places for the Snout-beetle (*Aramigus Fullerii*), and this pest is not slow in discovering any such cover. Fumigating or vaporizing with tobacco extract will be found necessary from time to time, vaporizing being the better method when properly applied, and less liable to injure the color of the flowers; but even this will affect the color if given too freely.

Holmesburg, Pa.

W. H. Taplin.

Lilies in Autumn.

MANY of the more valuable horticultural experiences are the results of accident, and not infrequently a little misfortune as well. Last spring one of our seedsmen had a number of cases of assorted Lilies left over from spring sales. After their journey from Japan in November of the previous year, and having been kept perfectly dry until the middle of May, the prospect of flowers from these bulbs was poor indeed. In hopes of saving something out of them, we planted the lot about May 20th. To our surprise, nearly all of them came up and made a vigorous struggle for life. The result was that this morning (October 10th) we have gathered from a bed of *L. Tigrinum splendens* as fine spikes as ever were cut in July. The plants of *L. speciosum* did nearly as well, but their flowers were over last week, excepting *L. speciosum Præcox*, which are in bloom, although the flowers are considerably damaged by the storm. *L. longiflorum* bloomed well, but were all gone a month ago. The plants of *L. auratum* behaved as they always do; some came up quickly, and flowered in August, and there have been flowers in the row every day since, while some are just coming up. These we shall pot for the greenhouse if there are enough to make it pay.

This experience has taught us that the season of Lilies can be kept up until after a hard frost with but little trouble, and add greatly to the display of autumn flowers. From the show these Tiger-lilies are making, it is evident they should not be allowed to bloom at any other season, as their deep, rich orange-crimson flowers are now in harmony with all their surroundings. For autumn flowers the bulbs should be taken up in November, packed away in dry sand or sphagnum-moss, and stored in some dry cool place until about May 15th. The low price of the bulbs of the *L. tigrinum* should make them popular autumn flowers, when they can be had with so little trouble and expense.

Floral Park, N. Y.

C. L. Allen.

Anthracnose of the Pear.—There is a considerable decay of the maturing pears due to an anthracnose. This rot of the

fruit is quite different from any other of the decays met with under similar conditions, and seems to have escaped identification. The fruit may be attacked at only one place, which spot soon turns brown and becomes sunken, as if it had been pressed upon with the end of the thumb. A little later the surface of the sunken place becomes covered with dark pimples, which are broad, instead of sharp-pointed, and finally become almost black. These pimples are the places where the spores are produced in great numbers upon the tips of projecting threads. The darkness of the pimples is due to the multitude of small black bristles which project in all directions from the centre of the mass of spore-bearing tips. Each pimple, in other words, is like a minute chestnut-bur, with microscopic spores borne between the spines.

A similar disease has been common upon the tomato during the season now closing. This trouble of the pear may be met with in the market, where it causes ruin to a fruit in a few days. Pears left upon the ground also exhibit the same, and become a means of propagating the anthracnose.

Rutgers College.

Byron D. Halsted.

Correspondence.

The Future of the Fair-grounds.

To the Editor of GARDEN AND FOREST:

Sir,—What will eventually be the fate of the World's Fair-grounds at Chicago? All the buildings, except, possibly, one, will, of course, be removed; but a great deal of labor and of art has been bestowed upon the site as such, and how much of this will prove to have been expended for a temporary purpose only?

The northerly portion of the grounds had been laid out as a park before the Fair was proposed. This portion has necessarily been somewhat altered, but can easily be restored to a condition equal, or superior, to its former one. If Mr. Atwood's beautiful Art Gallery is preserved, as its fire-proof walls will permit, necessitating only the substitution of marble or terra-cotta for the present external covering of "staff," it will be a priceless addition to this part of Jackson Park. Moreover, this park is intimately connected with the new lagoon and its charmingly planted island, where the Japanese temple and garden will be permanently maintained; and it will not be difficult to transform the areas around the lagoon, now covered by great buildings, into harmony with its shores and with the regions further to the north.

But beyond the lagoon to the southward the grounds have been disposed in a very different way. Here the scheme is a formal one, and verdure does not enter into it at all. Here there is not only the fine, wide, curving esplanade along the lake-side, but the great rectangular basin, running in at right angles to the lake-shore, and branching out in front of the plaza into straight wide canals. At present the effect of the grounds, as a whole, is as harmonious as it is magnificent, terraces like those which border the basin and canals being carried for a space along the sides of the lagoon, where one of the canals debouches, thus intimately uniting, in a way which satisfies both the mind and the eye, the naturalistic and the formal portions of the great design.

But what is to be done with the formal portions after the Fair is over? Must the basin and canals be destroyed, and, if not, how can they be fitted into any artistic gardening scheme? An interesting answer to this question was recently given by a writer in the *Boston Herald*. "On the terraces which border the basin and canals," he says, "and on the wide level expanses left by the removal of the buildings . . . it would be possible to lay out a formal garden on a great scale, elaborate in design and with rich and brilliant effects in the harmoniously blending and contrasting colors presented by extensive flower-beds and formal shrubberies, studied as carefully with reference to coloristic impression as any woven or embroidered fabric in its conception. Such a treatment of that portion of Jackson Park would be a revelation in the field of formal gardening, and its success, which could not fail to be great, would go far toward creating a distaste for the atrociously bad art of so much of the prevalent methods in flower-bedding effects, repellant in both their awkwardness of design and their discordant colorings."

This interesting suggestion would, we think, offer an ideal solution of the problem but for one important fact. There is another name for formal gardening; it is also called architectural gardening, and in this name we find a hint of the obstacle which lies in the way of the easy realization of the proposed scheme. An architectural garden implies the presence of a work of architecture. A formal garden is the

natural accompaniment, extension and, so to speak, repetition of the straight lines and symmetrical masses of a building. It may be only a few rods square, or it may be as vast as the park at Versailles. But, whatever its size, it cannot look well—because it cannot look right and sensible—unless its formality is explained and justified by the presence of some structure with which it is intimately connected. As the basins and canals of the World's Fair are to-day, they are eminently beautiful because eminently right. The eye understands at once that they were planned as a means of approach to the magnificent structures which stand around them, and with which their own magnificence, in size and adornment, is in perfect keeping. But destroy the buildings and they would lose their purpose. They are not features which ought to exist by themselves, and they would not exist for the garden, should it be established; the garden would evidently exist for them. They would have no adequate purpose, and, lacking this, they would lose their artistic value and charm. If the great peristyle at the lake-shore end of the basin could be preserved with its flanking buildings, if a large but low structure for some public use could replace the Administration Building, and if a smaller structure could be placed at the southerly end of the canal, which the entrance to the stock-yards now finishes so finely, then indeed the treatment of the remainder of the grounds might be carried out as the writer in the *Herald* suggests, with a good prospect of producing the finest formal garden in the world. The finest, that is, in which avenues of trees do not play a conspicuous part, for such avenues ought not to be attempted where they cannot be perfectly developed, and it seems improbable that such could be the case where this part of the Fair now stands.

If, then, Chicago is willing to build appropriate structures around this basin and canals, the problem they offer will find a delightful solution. But they would have to be built from the ground up. The present ones, excepting the peristyle and its flanking halls would not be appropriate; and even if they would, they could not be preserved, for their walls are of lathing, not of solid brick, as are the necessarily fire-proof walls of the Art Building.

The mention of this building brings a regretful thought. For the purposes of the Fair its best place is its present place, and if it is preserved, we could not, for its own sake, wish to see it on a more beautiful site. But for the sake of the great formal garden which might be created around the basin and canals, one is tempted to wish that it had chanced to stand where the Administration Building stands. Then, a formal garden covering all this portion of the Fair-grounds would indeed be appropriate; and, especially if Mr. McMonnies' splendid fountain at the end of the basin could likewise be reproduced in marble, its general effect would indeed be one which any city of the world might begrudge to Chicago. But this is a dream impossible of realization. One can only hope that Chicago may see its way clear to preserving the Art Building where it is, and also to erecting other buildings which will justify the preservation of the basin and canals, and their inclusion in a great architectural gardening scheme.

Boston, Mass.

X.

[Whether or not great buildings are essential for formal gardening it is not our purpose now to discuss, but symmetrical arrangements are, without doubt, useful and appropriate wherever great crowds are to convene for any purpose. This seems to justify the Mall in Central Park and the Greeting in Franklin Park, Boston. We do not think, however, that the design of the Fair-grounds would justify any attempt to convert them hereafter into a formal garden. In the first place, if an artist wished to design an architectural garden with water in it he would very probably select a different form from the water scheme in Chicago, which relates to the great buildings about it, supporting them, exhibiting them to better advantage, and furnishing means of access to them. The basin with its arms is reasonable now with the buildings about it, but, no doubt, a hundred better plans could be devised if the water was meant to be part of a great symmetrical garden.

This makeshift propensity to force things to answer some end for which they were not designed and for which they are therefore but imperfectly adapted, seems to have become one of the acquired vices of our national character. Of course, it was natural, in so great a work as that at Chicago, that this propensity should manifest itself at once, and the fact is that a hundred enterprising persons

have set out to hunt up reasons and excuses for making the expedient and temporary structures of the Exposition to answer for some end which was not thought of when they were designed, and for which they can by no possibility be well adapted.

Besides this frontier feeling which "guesses we can manage to make it do," there is the thrifty suggestion that it is a great waste of opportunity not to use this great basin to some noble end. But the fact is that the walls of this great basin, like all the other structures, and even the grounds themselves, are of the most temporary character. As Mr. Olmsted has well stated, what they have been making in Chicago is a "camp"—a place to be occupied for a brief period only—and their work is good or bad as it is adapted to serve a definite purpose during that period, and no more. The Art Building is exceptionally substantial, but this is not so because it was meant to be fitted for any more distant and lasting purpose than the other structures, but because no valuable pictures would have been sent to a building which was not secure from injury by fire, tornadoes, mobs or earthquakes. What has been said of the temporary purpose of the structures in general applies with increased force to the canals, basins and terraces. The surface staff is laid upon a wall of slender piles and planking, which are only meant to be strong enough to hold up the banks for a year. Not only will the staff be peeling off and breaking soon after that, but the timbers and planks will be springing out and giving way, and in a few years natural forces will warp and crack and crumble the walls, and begin the work of establishing an irregular, meandering shore-line which is wholly agreeable as the boundary of water-courses in a park when it is prepared with a natural motive, but wholly unsuitable to an architectural garden.

Besides this, the apparent high ground of the Exposition is in reality nothing but deceptive ridges which enclose great craters now covered by buildings and terraces. There is not an acre of ground now having an architectural aspect upon which a piece of good permanent formal garden could be made without great outlay for grading and establishing fixed architectural conditions. Looking at the Fair-grounds as a site for a great public park for Chicago in future years it would be much cheaper to provide agreeable natural scenery than to perpetuate the conditions now seen on the grounds.—Ed.]

In the Redwood Forest.

To the Editor of GARDEN AND FOREST:

Sir,—The larger part of my summer vacation has been spent camping in the Coast-range upon a tract of eighteen hundred acres north of Russian River, reached by the North Pacific Coast Railroad from San Francisco, a line that has opened up some of the most attractive districts in California. The eighteen hundred acres, mostly covered by forest, are the property of William Montgomery, a well-known capitalist, and has been kept with great care, so that it would be a pleasure to live there for months instead of for weeks. Redwood groves, famous throughout California, occupy the "flats" along Austin Creek, and lesser, but still remarkable, forests fill the branch cañon. Along the eastern side of the tract the Oak country begins; toward the ocean the Redwood is more mixed with Douglas Spruce, and the Tan-bark Oak (*Quercus densiflora*) attains a larger size.

The atmosphere is dry and clear at this season, and the best place to pitch a tent is often in the deepest recesses of the forest, where only glimpses of the sky can be obtained. I had long had an idea that the Redwood forests were too damp for comfortable camping, and it may be so near the ocean, where the fog rolls in, but on Austin Creek, at least, any person fit to live outside of a hospital could make himself comfortable at this season. An old sailor who lived in a small cabin in the vicinity told me, however, that it "did rain awful every winter." Late in the autumn, too, as I learn, the insect-life of the forest is very annoying. July and August are almost free from these pests if one does not camp in the Laurel-clumps, which are said to swarm with various abominations.

Besides the Redwoods, there are beautiful tall Maples by the

stream and a solitary *Torreya Californica*, the only one in the region. Immense bushes of *Rhododendrons* in full bloom fairly line the banks. The distant effect is of white masses against the dark Redwood, but upon a nearer view the delicate buff markings tinge the white. Watson's description of *R. occidentale*, the California *Azalea*, mentions the "pale yellow bands upon the white or slightly rosy flowers." I have sometimes seen plants to whose flowers pale yellow applied, but the generality are marked with a distinct buff of various shades, depending upon age of flower, location, or minor variations of the species. Watson (*California Botany*) gives the height of *R. occidentale* as from four to six feet, but on Austin Creek, at least, it seems hard to find plants of less than eight or ten feet in height.

Several miles below our camp the Redwood forest was cut by lumbermen twenty or thirty years ago, and it has since partially grown up. This region possesses a peculiar interest to me because, more than any other place I know of, it shows the kind of reforestation that might easily be had with a little care from capable officials. If the fire had been kept out of several hundred acres along Russian River and Austin Creek, its tributary, there would be a fine and well-distributed growth of Redwoods there, for few cattle and sheep are in the region. The lumbermen left many old decayed trees, which sheltered the stumps, so that nearly all sprouted, and the young Redwoods are now loaded with seed. Richer soil could hardly be obtained anywhere, and if the fires which have swept through here nearly every other year were prevented, the second growth would be valuable.

In this old lumberman's camp, wild Blackberries, Raspberries and Currants have taken possession of acres. But the most remarkable feature is the extent to which the common Bigroot, *Megarrhiza Californica*, has become a drapery for stumps and fast-dying Redwoods. It is the Ivy of every deserted Coast-range lumber-camp. Twenty, thirty, forty feet above the ground, its star-like flowers, prickly balls and pale green leaves trail downward. In luxuriance of growth it almost rivals the wild Grape. But it stays in the clearings; you may search the deep forest for miles without discovering a plant of *Megarrhiza*.

In the early days of lumbering here, the Redwood-trees were cut at a height of twelve or fifteen feet from the ground, the best part of the trees being wasted. Many such stumps still remain and are being worked out for the lumber. In one case on Russian River, a stump fifteen feet high and sixteen feet across yielded fifteen thousand feet of lumber which sold at \$40 a thousand because it happened to be of especial beauty for cabinet-work. This stump was taken out by Colonel J. B. Armstrong, of Guerneville, who afterward told me the particulars. The labor of four men for three days was required to saw off the stump at the surface of the ground; then it was necessary to use eight yoke of oxen to drag the stump over. After splitting the log into four parts with powder, it was taken to the mill, and turned out, as I have said, fifteen thousand feet of "curly Redwood." If all the stumps paid like this, there would be work for many companies in the deserted lumber-camps, but it is easy to see that many are shattered, decayed or destroyed by fires. In cases where the lumber from the stumps is of no value, the cost of clearing bottom-land is from one hundred to four hundred dollars per acre. The fruit-growers along the Russian River usually spend from fifty to a hundred dollars "clearing brush," and plant their Prune and Peach orchards among the blackened stumps. Some of the finest fruit-trees I have ever seen were growing in this way. The soil is very deep and rich. No finer orchard-soil can be found anywhere.

Berkeley, Cal.

Charles Howard Shinn.

Recent Publications.

The Foot-path Way. By Bradford Torrey. Houghton, Mifflin & Co.

The song of that light-hearted rogue, *Autolycus*, with whose peccadillos we are inclined to sympathize in spite of our Puritan inheritance, seems a little out of place upon the title-page of a volume which records the impressions and observations of a naturalist of the nineteenth century. For, in these days, we are nothing if not scientific—while the song from the *Winter's Tale* was written in the days before science was. Forever associated with the merry harvest-feasts of Bohemia, over which *Perdita* presided, it suggests that spontaneous delight in out-of-door life found now only in the child which has not yet borne the burden and heat of the day, or perhaps, in the tramp who evades them. But, since the paradise once lost may not be regained, and even our children's play-hours

must have some touch of serious earnest, it may be that the passion of the scientist will prove no unworthy substitute for the glories that have passed away. We are not surprised, then, that a walk over the "Foot-path Way," under Mr. Torrey's guidance, is no dreamy saunter over highways and hedges, with heart and mind passive and inert, and the senses only half-responsive to the myriad enchantments with which nature would woo the wanderer from his petty cares; but rather a rough scramble over hill and dale, "through bush, through brier," with every sense alert and vigorous, and the mind as keenly alive to the quest of the moment as if the fortunes of a state depended upon the observations taken during a morning's walk. This volume, like its predecessors, by the same author, "*Birds in the Bush*," and "*A Rambler's Lease*," consists of a series of essays on out-of-door topics, most, if not all, of which were first published in the pages of the *Atlantic Monthly*. To Mr. Torrey, all objects in nature, whether animate or inanimate, have both charm and significance, and though his own interest centres chiefly in birds, his eye is trained to note the grace and beauty of every way-side flower, and his ear quick to catch in the solemn music of the Pines "some accents of the eternal language" which he would fain interpret, if only with faltering accents, to his fellow-men.

But Mr. Torrey's love for birds is more human than ornithological, and bespeaks the man rather than the scientist. He studies them as individuals rather than "en masse"; delights in their idiosyncrasies and depicts their little virtues, or, perhaps, their vices, in a fashion peculiarly his own. For this reason the pages in which he records the manners and customs of his feathered friends prove very pleasant reading even to those who do not share his enthusiasm in his favorite pursuit. The information he gives is interspersed with flashes of playful fancy and occasional touches of genuine humor which would give charm even to a duller subject, and we cannot but envy him his enjoyment. "A happy man," he tells us, "is the bird-lover—always another species to look for, another mystery to solve. His expectations may never be realized, but, no matter, it is the hope, and not the fulfillment, that makes life worth having. How can any New Englander imagine that he has exhausted the possibilities of existence so long as he has never seen the Lincoln finch or the Cape May warbler? But I speak 'as a fool.' Our happiness, if we are bird-lovers, indeed, waits not upon novelties and rarities. All such exceptional bits of private good fortune let the fates send or withhold as they will," and so, though he feels all the scientist's enthusiasm for the "novelties and rarities" that fly across his path, he finds a sober certainty of waking bliss in watching the daily and nightly habits of the birds that from time immemorial have haunted the abodes of men.

In the paper entitled "December Out-of-doors," he writes very pleasantly of the kill-deer plovers, the presence of which in great numbers made the winter of 1888-89 famous in the ornithological annals of New England, but even his interest in this rare "find" does not blind him to the delicate winter loveliness of the vines and mosses, nor make him forget to note the sixteen sorts of wild blossoms to which December sunshine had given courage to brave December storms. In "A Widow and Twins" we have one of the prettiest bits of observation ever recorded in the annals of a naturalist. The widow is a tiny humming-bird deserted apparently by her mate at the time when she is most in need of his protection, and Mr. Torrey enables us to watch with eager interest the tender care she bestows for eight long weeks upon her mites of nestlings, until, at last, the period of infancy safely passed, all three fly away to some brighter clime, to return once more perhaps when the Honeysuckle is again in bloom. In "Robin Roosts" we learn the rather startling fact that robins fly for miles at nightfall to roost with thousands of their mates in some grove which has been chosen for the season as the nightly trysting-place of all the clan. The paper which shows the most true poetic feeling is that written in praise of the White Pine, which, for some reason he does not give, Mr. Torrey chooses to call the Weymouth Pine. For the moment he is above science and the objects of science, and is only conscious of the beauty of the solitary Pine and the impressive solemnity of the Pine-forest, dark, spacious, slumberous, musical. The lowly Partridge-berry and the showy Lady's-slipper attract him, for they are always the Pine-tree's neighbors, and with them he would listen to the murmuring leaves, which give utterance to musings and feelings that lie too deep for words. But these moods pass: "We are always in the presence of natural beauty, but only on rare occasions are our eyes anointed to see it. Such ecstasies it seems are not for every day. Sometimes I fear they grow less frequent as we grow older. We will hope for better things; but should the gloomy prognostications fall true, we will but

betake ourselves the more assiduously to lesser pleasures—to warblers and Willows, Roses and Strawberries. Science will never fail us. If worse comes to worst, we will betake ourselves to the moths.”

Notes.

It is estimated that the cemeteries of London cover an aggregate area of 2,000 acres, the value of which is not less than £2,000,000.

In the issue of *Gartenflora* for September 15th, it is noted that twenty-seven horticultural firms had thus far announced themselves to the Berlin committee as intending to exhibit at the World's Fair in Chicago.

Of the common shrubs that are valued for autumn color the Forsythias should not be forgotten. The deep chocolate color of the leaves just now is an admirable foil to the lighter and brighter tints of many species.

The most beautiful fruits in the market now are the Japanese persimmons. One variety, larger than a goose-egg, and with a smooth skin of a clear canary-yellow, seems to be as fair a product as any orchard ever yielded.

The product of some California orchards, as reported in a late letter to *The Tribune*, of this city, are somewhat astonishing. For example, a sixteen-acre orchard of German Prunes in Sonoma County, from five to eight years old, yielded 90,000 pounds of dried fruit this year and a net profit of \$7,500.

Several of the annual horticultural and pomological exhibitions usually held during September in north Germany have been officially interdicted, on account of the fear of cholera. This is especially regretted at Breslau, where not only an exhibition but a pomological congress was to have been held.

Among the plants that are conspicuous for their beautiful fruit just now are *Berberis Thunbergii*, *B. Sieboldii*, *B. Chinensis*, *B. Amurensis* and the yellow-fruited form of *B. vulgaris*. The *Prinos* section of the Hollies are also at their very best, especially *Ilex Sieboldii*, and *I. lævigata* with its yellow form. Some of the species of *Evonymus* are making a beautiful display in the Arnold Arboretum, especially the variety *Coccinea* of *E. Europeus* and the rose-colored variety from Japan. The fruits of many shrubs are so beautiful and last so long in good form that Mr. Jackson Dawson writes to suggest that some one should plant an autumn garden of shrubs which are especially valuable for their foliage and fruit.

A writer in a recent number of a Belgian horticultural journal speaks of the "veritable invasion" of his region this year by insects of the genus *Aphis*. "It is enough to make one believe," he declares, "that each plant has a species of its own, even weeds being attacked. Young and mature turnips, artichokes, endives, leaves and fruits—everything is threatened with death by this multitude of tiny parasites. Potatoes are not spared, but it is to be remarked that those which were sprayed with Bordeaux mixture have remained intact. In the nurseries fruit-trees and other species have suffered to the point of denudation. Copious irrigation, while it does not destroy the insects, invigorates the plants and enables them better to resist their depredations. A machine seems to be needed which will spray small plants from beneath with poisonous mixtures, since the clever aphides keep mostly to the under sides of the leaves."

In 1868 the "Portland Catalogue" of plants native to the state of Maine was issued by Professor Goodale and the Reverend Joseph Blake, and since then no complete account of the flora of this state has been published. It will, therefore, be welcome news to local botanists that a second and enlarged edition of this catalogue has just been issued, especially as the original one has become very rare. The new edition has been prepared by Mr. Merritt L. Fernald, and is a reprint from the *Proceedings of the Portland Society of Natural History*. It is simply a list in which the distribution of the more common plants has been noted by means of symbols, but it contains more than four hundred and fifty species and varieties of flowering plants and vascular cryptogams in addition to those named in 1868, the whole number amounting to more than one thousand five hundred and fifty.

In reply to an inquiry from the Boston Metropolitan Park Commission for information concerning statutes relating to parks, the chairman of the Berlin Committee on Parks, Gardens and Tree Plantations replied that in Prussia special laws relating to the laying out of public parks and gardens have

thus far been considered unnecessary, since every community has been alive to the desirability of such institutions, and, therefore, legislative compulsion has not been required. Travelers in Germany will bear testimony to the truth of this. In every city tasteful public gardens and parks will be found; choice landscape passages are carefully preserved and their beauty enhanced; and there are usually extensive public forests in the neighborhood, offering delightful recreation to the people, while the city draws profit from the timber and fuel cut there. May the time be hastened when our American communities will universally show their public spirit in the same enlightened manner.

Sub-irrigation has been tried in the greenhouses of the Ohio Experiment Station. Two beds, fifteen feet long and seven and a half feet wide, were floored with matched boards laid in white-lead so as to be water-tight, and the ends and sides were made water-tight. In the bottom of these benches three-inch tiles were laid two and a half feet apart, and arranged so that water could be supplied to each row as desired and six inches of soil were then placed on the benches covering the tiles out of sight. The effects of sub-irrigation upon the growth of Lettuce and Radishes were remarkable, and it was beneficial decidedly to Cucumbers. The first crop of Lettuce on the sub-irrigated beds was some thirty per cent. heavier than the crop on the bed treated in the ordinary manner, while the second crop showed a gain of fifty per cent. in favor of sub-irrigation. Radishes treated in this way came to marketable size earlier and were larger than those grown by the ordinary method. Nearly one-half of the sub-irrigated Radishes were ready to pull before one of the others could be used.

The colored frontispiece to the issue of *Gartenflora* for October 1st shows the portraits of two specimens of the Ontario apple, and is accompanied by a laudatory description written by Herr Carl Matieu, of Charlottenburg. The author says that this fruit, although described as early as 1885 in America, has not been hitherto noticed in Europe except by a single brief reference in a periodical published in 1888. On the 28th of April of this year, he says, he laid specimens of it before the Congress for the Promotion of Horticulture in the Prussian States. "The fruits were in the best condition, showing very slight, if any, signs of shrinkage, and yet had not been wintered in a cellar, but merely in a ground-story room with a northern exposure, laid on a layer of thick paper and shielded from the air only by two thicknesses of newspaper. They were cut from a tree trained on cords, four years old and about a metre in breadth, and from a pyramidally trained tree of the same age, and about a metre in height, and numbered in all twenty specimens." After explaining how easily this Apple may be grown in various ways, the writer adds that it is especially remarkable for its keeping qualities, for its delicious flavor and for the delicate substance of its flesh, which fits it admirably "for old people who have no longer any teeth which they can call their own."

At the forty-first meeting of the American Association for the Advancement of Science, held at Rochester, New York, in August last, Mr. L. M. Underwood spoke before the Botanical Club of "A Variety of *Polypodium vulgare*, new to America." "In the autumn of 1890," says the report of his words, published in the *Bulletin of the Torrey Botanical Club*, "my attention was called to a peculiar 'crispy' fern, growing on Mohawk Mountain, Connecticut, by Mrs. T. R. Waite, of New Haven, who had spent several summers on the summit of the mountain in the log-cabin established there for tourists. The plant proved to be a variety of *Polypodium vulgare* hitherto unknown in this country, but described from England as var. *Cambricum*. The plant is easily recognized by its deeply pinnatifid pinnæ, which are strongly in contrast with the normal entire pinnæ of typical forms of the species. This discovery is rendered more interesting by the announcement of the *State Botanist*, of New York, of a second European variety of this same species. Unlike var. *cristatum*, as figured by Peck and shown in the specimens kindly communicated by him, the specimens of var. *Cambricum*, as found on Mohawk Mountain in August, 1890, and again in July, 1891, were entirely sterile, not even showing rudimentary sori. The plants were growing on the sloping face of the granitic rock of which the mountain is composed, in small patches thoroughly entangled with plants of normal *Polypodium vulgare*. Environment is, therefore, not the cause of the variation in this instance, but it must be attributed rather to an inherent tendency to be something different. It is a question of interest to know just when to recognize a form of this kind as a true botanical variety."

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLES:—Trees in October.....	505
"Jericho Roses".....	506
The Weeping Spruce.....	506
Notes of a Summer Journey in Europe.—XVI.....	J. G. Jack. 506
The Mountain Flora of Alabama.....	Dr. Charles Mohr. 507
PLANT NOTES:—Aristolochia Siphon. (With figure.).....	509
Yun-nan Rhododendrons.....	510
NEW OR LITTLE-KNOWN PLANTS:—Cypripedium Warnero-superbiens. (With figure.).....	510
New Orchids.....	R. A. Rolfe. 510
FOREIGN CORRESPONDENCE:—London Letter.....	W. Watson. 510
CULTURAL DEPARTMENT:—A Few Neglected Grapes.....	E. P. Powell. 512
The Vegetable-garden.....	Professor W. F. Massey. 512
The Crown-bud of Chrysanthemums.....	T. D. H. 513
Begonia gracilis.....	J. N. Gerard. 513
The Ornamental Value of Sedges.....	Professor L. H. Bailey. 514
CORRESPONDENCE:—Some Remarkable Plants in San Diego.....	Dr. E. F. Franceschi. 514
Apples Exempt from Scab.....	George J. Kellogg. 514
Why do Fruits Drop Prematurely?.....	Professor S. A. Beach. 514
Warm Water for Tender Nymphæas.....	W. W. Lee. 515
A Unique Chrysanthemum Show.....	Clara S. Brown. 515
PERIODICAL LITERATURE.....	515
NOTES.....	516
ILLUSTRATIONS:—Aristolochia Siphon on the house of Mr. S. B. Parsons, Flushing, Long Island, Fig. 86.....	509
Cypripedium Warnero-superbiens, Fig. 87.....	511

Trees in October.

THIS year the beauty of the autumn landscape has been enhanced by the delaying of severe frosts and by a succession of windless days, which gives the final touch of perfection, like the bloom on a fruit, to the rich color which enwraps the woodlands. Though chilly nights have done their work, the days of early October were replete with sunshine and the temperature has been perfect, as if nature wished to aid the rejoicings of the Columbian year, and to that end had hung out her banners in more dazzling splendor than ever. Perhaps the dryness of the season has prevented the best development of the leaves, and in some cases marred their beauty. The absence of high winds, however, has kept the trees in foliage beyond the usual time, and made the outdoor enjoyment of them continually possible. To the tramping myriads in New York these days have been a priceless boon, as well as to the throngs of spectators who watched for hours the great processions on the natal day of the New World.

If a June day in New England is perfection, as the poet sings, that "rareness" is rivaled by these October days when earth and sky and air are once more attuned to perfect harmony, and the funeral pyre of the dying summer is robed with purple gold and flames with crimson and yellow fire. The variations of tint in even a small group of trees are wonderful. The scarlet of the Swamp Maple is relieved against the claret and bronze of the Ash; the bright chrome of the Beech melts into orange shading into red of the Rock Maple; the Oak, with its amber-bronze flushed with crimson, forms the deepest tone in this scale of color which is here and there relieved by the green of some slowly fading deciduous tree or the rich dark foliage of the Pines and Hemlocks. Upon the hills the Chestnuts turn to amber, the Scotch Larches hold aloft their tasseled branches of tawny gold, so that the frost-touched Hickories,

shriveled and brown, look dull beside them, while the dark blue Cedars stand up stiff and tall unchanged as yet by the cold.

Physiological botanists tell us that the kindling color in autumn leaves is due to the breaking up of the chlorophyll pigments into xanthophyll and erythrophyll, but if the man of science pursues the subject much beyond the giving of names to substances of whose composition he knows little, he soon reaches the absolute limit of his knowledge in this direction. We know that in our New England states these colors are much more brilliant than they are on the other side of the Atlantic, and our trees when transplanted to the gardens of Europe lose much of their autumn glory. It is supposed that our less humid climate in some measure accounts for the difference, and we know that the autumn coloring of the woods in a cool moist season, when lusty growth continues until freezing weather, is not so rich as it is in those years when the autumn air is drier and the sunshine brighter. Frost may hurry or modify this process of changing color, but it is not essential, certainly, because leaves often turn long before the frost appears. Thoreau says that color stands for all ripeness and that leaves before they fall acquire these bright tints just as fruits do when they mature. This is poetical analogy, however, and not science, for it is found that the changes in these two cases are caused by entirely different processes in the subtle chemistry of life.

But, whatever the causes of this marvelous change or however its processes are carried on, no one can look unmoved upon the splendid pageant. Our eyes never become weary of it, and every year it is witnessed with renewed wonder and delight. Individual trees and small groups of trees are strikingly beautiful in their way, but they cannot compare in magnificence with a great stretch of forest when it can be seen from above or when it sweeps up some broad mountain slope. Perhaps this is an insignificant point to be considered by those who wish to preserve our forests, and yet, if our woodlands are swept away in great breadths, the country would be robbed of a distinct feature of its autumn attractiveness. We should think lightly of Venice if she were ready to give over to the destroyer her acres of canvas rich with color and splendid in design. Certainly that man lacks patriotic pride who can see unmoved the destruction of miles of forest which every autumn paints in colors which would drive Titian and Veronese to despair if they should ever attempt to emulate them with brush and palette.

We have heretofore noticed the fact that individual trees of the same species often show marked differences in their autumn coloring. Close observation shows that these characters are persistent—that is, if the leaves of a certain Oak are more brilliant than those of any of its associates this year, they will continue so year after year. The general display may vary with the season, and, as a whole, it may be more or less brilliant, but these individuals always stand distinctly out from the others in effects of color. It is also true that sometimes the leaves on a single Maple-branch will turn scarlet, while the remainder of the tree is green, and it will do the same thing next year, and the next. Gardeners have perpetuated peculiarities of this sort with trees of abnormal color like the Purple Beech, or unusual habit of growth, like the Pyramidal Oak. Is it not a promising field of experiment to select certain trees with reference to the quality of their autumnal tints and secure a race of Maples or Oaks or Elms of unusual brilliancy? It might be found that the stock on which these cions were grafted would influence their coloring. It might be discovered that the peculiar brilliancy of individual trees is due to some chemical quality of the soil in which their roots feed. These certainly are matters which ought not to be left to conjecture. In the interest both of science and of art, the subject is worth investigation by our experiment stations, and there may be enterprising nurserymen who are willing to put the matter to practical test as a business venture.

A MEMBER of the well-known horticultural firm of Dammann & Company, near Naples, recently contributed to *Gartenflora* an interesting article on certain plants which, for centuries, have been called "Jericho Roses." These are natives of the deserts of Palestine, which, in ancient times, were thought to possess magical powers, because when they had long been in a desiccated condition they would at once expand and seemingly revive if immersed in water. Many specimens were brought home by the Crusaders, and so highly were they prized, for semi-religious reasons, that they were often represented in the paintings on old shields which still exist in France.

One of these plants, says the writer from whom we quote, is *Anastatica hierochuntica* of Linnæus, which belongs to the Cruciferae, and its name comes from the Greek *anastasis*, meaning "Resurrection." It was introduced into European cultivation in the year 1597, but the evidence of old armorial paintings shows that it was known, in imported specimens, at a very much earlier day, while ancient records tell that, in the time of the Crusades, a person who possessed such a specimen won wide distinction from the fact. "Drawn by the hot sun shining on the white sands of the desert," says our author, "into tight blanched balls, the dry twigs expand when placed in water just as a sponge does, or, indeed, any other desiccated plant. When again dried, the twigs contract once more, and this process may be often repeated during a period of several years. About a quarter of an hour is required for the unfolding, and the plant must be completely immersed, preferably in warm water." This "Jericho Rose," which, however, we are told is not the "true" one, is the only known species of its genus, but is most nearly related to our *Arabis* and *Cardamine*. Never attaining a height of more than eight centimetres, it spreads so widely that it sometimes forms a considerable bush, with a deep tap-root, furnished with but few rootlets, which eventually assumes a woody consistency. The outermost ones of its many stiff twigs curve inward, so that a characteristically developed specimen looks like a solid ball cut in two horizontally, and presenting a perfectly flat upper surface. The small white flowers are scarcely visible, and are usually deeply imbedded in the densely packed and somewhat fleshy foliage. The writer says that though this plant is reputed very difficult to cultivate, he has succeeded in raising specimens nearly half a metre in diameter, which look like smooth little green carpets.

The "true Jericho Rose," however, is *Astericus pygmæus* (formerly known as *Odontospermum pygmæum*, Neck.), which belongs to the Composite family. Although described by botanists only in recent times, it is, like the *Anastatica*, very faithfully pictured on old French crusading shields. Its name, of course, like that of our *Asters*, was inspired by the starry form of its blossoms. When dried, it has an absolutely dead and wooden appearance, but if placed in tepid water it expands entirely in the brief space of one minute, so that, in more superstitious ages than ours, it was very naturally accredited with non-natural powers. This Jericho Rose grows in the Canary Islands, in Africa and in Arabia, but with especial frequency in the deserts near the Suez Canal, whence, in a dried condition it is brought by the Bedouins to the bazaars of Jerusalem and the other cities of the Holy Land.

A picture of this *Astericus*, published with the article in *Gartenflora*, shows an apparently leafless plant, bearing, at the ends of stout flower-stems, a number of rather large fleshy star-shaped heads forming a flattened group around a larger central head, the arrangement recalling that of the familiar Stone-crop, which our children call "Hen and Chickens." Specimens may be obtained, our author informs us, from Herr George Eggers, of Joppa.

FOUR-score years have not sufficed to chill the enthusiasm or curb the enterprise of the veteran Robert Douglas, who has been making a trip on horseback over the Siskiyou Mountains to visit the famous Weeping Spruce (*Picea*

Breweriana). In a private letter he writes of this tree that, "to appreciate its appearance one must imagine a Norway Spruce from a hundred to a hundred and thirty feet high and three feet in diameter breast-high, with branchlets set thick together along each branch and hanging straight down sometimes to a length of six feet, although no larger than a lead-pencil at the point where they leave the limb." From a small twig which he kindly sent the foliage seems to be better than that of the Norway Spruce, not so long, but wider and thicker, and of a lighter and more cheerful green. The cones before they open are about as large as a man's middle finger. The seeds are small, although a trifle larger than those of the White Spruce, and Mr. Douglas estimates about 50,000 seeds to the pound. Several persons have tried to collect these seeds, but, so far as we know, Mr. Douglas was the first one to gather them, at least in any quantity. The trees stand on the steep mountain-side, and the cones are all on the very topmost branches of the tree and more than a hundred feet from the ground. In prospecting about this vicinity Mr. Douglas found a few trees that had not been discovered, so that in this station there are about a hundred full-grown trees. Standing where the snow lies over more than one-half of the year, and where the cold is very severe, they should be able to endure the severest eastern winters, although it is doubtful whether they would stand in a very dry atmosphere.

Notes of a Summer Journey in Europe.—XVI.

WITHIN a few years there has been a good deal of controversy in some foreign journals regarding the value of schools of horticulture and agriculture, and it is a subject of constant discussion among gardeners and farmers as individuals. Among a large class the idea seems to prevail that such institutions are of little value, that the teaching is theoretical rather than practical, and that graduates from these establishments are really less efficient and less valuable than men who have been working gardeners and farmers from their youth, and who have never been troubled by scientific considerations in their occupations. Another argument used against the school-training has been that the openings for specially trained men are extremely few, and that a graduate of a horticultural school has less chance of obtaining a good situation as gardener, at a satisfactory salary, than the man who never heard a lecture on botany, vegetable physiology or entomology, and who, moreover, would be willing to work for lower wages. But the old adage, "Knowledge is power," seems to hold here as in other occupations, and we find that natives of Germany, France, Belgium and other countries famous for their horticultural schools, are, in the majority of cases, to be found taking leading positions in matters relating to horticulture in almost every country in the world. It is true that two or three years of training in a school cannot produce a mature gardener, thoroughly experienced in all branches of his craft, but a good training will lay the best possible foundation for the acquirement of knowledge and the highest use of it.

One of the best of the French schools of horticulture is that at Versailles, being an institution founded and maintained by the Government. The grounds of the school were formerly, for about two hundred years, used as a sort of royal kitchen-garden, being laid out under the reign of Louis XIV. at a cost, we are told, of nearly a quarter of a million dollars. The total area is twenty-three or twenty-four acres. It is now about eighteen years since its foundation as a national school of horticulture, and already the records show valuable and interesting results in the number of pupils who have graduated as practical gardeners, and the responsible positions many of these graduates have taken in various horticultural and botanical establishments. About six hundred students have already received the benefit of a course of instruction here. The school is freely open to any one between seventeen and twenty-one years of age who can pass a satisfactory examination in the four ordinary studies of the common schools.

The course of instruction is completed in three years, and includes a general knowledge of botany, zoology, economic entomology, chemistry, geology and drawing, besides the subjects generally considered as pertaining to practical horticulture. If a student passes a satisfactory examination at the end of his course he receives a certificate from the Minister of Agriculture. Vacations are short, and the students perform

all the manual labor, in every detail, in the gardens and grounds, so that they get a thoroughly practical training as well as the knowledge derived from lectures and books. At the time of my visit, in early September, it was plainly to be seen that the practical part is done in a thorough manner, for, although many of the students were away on furlough, I found the place in fine condition, neat and free from weeds, the plants showing the result of good cultivation and care. The whole establishment is divided into neat beds and squares devoted to particular purposes, and there is also a considerable area covered by glass houses and frames.

In growing fruit-trees the artificial espalier system, so general in French gardens, is almost entirely resorted to; the plants grown are also very largely dwarfs. The system is one very rarely practiced among such fruits as Pears and Apples in our own country, but fruit of a very fine quality can be raised in this way. The small area of the school-grounds necessitates some such practice, because if normal trees were grown there would be space for but a very limited variety, and, moreover, the natural system would not suit the prevailing demand and necessity. It is stated that there are about twelve hundred varieties of fruit-trees and fruiting-shrubs grown in this garden. Of these nearly one-half are pears. This fruit has been so much cultivated and improved by Frenchmen that one almost regards pears as the national fruit of France, as the Fleur-de-lis is the national flower. There are more than three hundred varieties of Apples; of Peaches there are about a hundred and twenty-five varieties, while Apricots, Cherries, Grapes and other fruits are well represented.

A small piece of ground is used as an arboretum or collection of ornamental, shade and forest trees, and a good number of specimens have been accumulated. But the area available is so small that the plants hardly have nursery-space and are very much crowded, yet the collection may serve a useful purpose in assisting pupils to become acquainted with and to identify the various species and varieties, of most of which fine, well-developed individual specimens may be studied in parks and collections at other places in the vicinity of Paris.

In flowers this garden is probably most famous for its Roses, which were somewhat of a specialty with Monsieur Hardy, the late director, who did so much for the advancement of the school. His name and his father's name are commemorated in a most curious little single-flowered Rose, which is said to have originated in the Luxembourg garden more than half a century ago, by natural hybridization between *Rosa clinophylla*, a white-flowered Indian species, and the curious yellow-blossomed, simple-leaved *Rosa simplicifolia* from Persia and countries north and east of it. This odd little hybrid is known as *R. Hardyi*. As seen growing in the vicinity of Paris it seemed so dwarf and slender as to almost appear herbaceous, and its habit reminded me more of our little *R. foliolosa* than any other species. The stems of *R. Hardyi* are armed with a few stout straight spines; there are from five to seven small dark green leaflets to each leaf; and the flowers are about the size of those of *R. foliolosa*, but instead of being produced solitarily there are several on the end of each shoot. The petals are light or sulphur-yellow colored, the color deepening slightly from the tip toward the base; while the base of each petal, for nearly a fifth of its length, is of a dark crimson color. This Rose seems to bloom freely, and I saw it in blossom at Paris in the middle of July and again in early September. It is not likely that it would be hardy in our northern or New England states and I do not know that it has been tried here.

The greenhouses and forcing-houses are simple in construction but well calculated to serve the purposes intended. Nearly two hundred years ago, when it served as a pleasure and pastime for the King, this garden was famous for the early forcing of fruits and vegetables, but since then it is easy to imagine the great strides which have been made in improvement of methods and in the qualities of varieties.

The buildings used as class-rooms and for similar purposes are very simple in construction and arrangement and unpretentious in appearance. They contain a herbarium for constant reference; herbarium specimens which show the character of the injuries caused by particular kinds of insects and fungi; collections of beneficial and injurious quadrupeds, birds and insects; a very large number of excellent models of fruits; examples of seeds and other subjects of an instructive character. A well-selected series of woods of trees shows the character and appearance of important species when cut and finished in several different ways, while sections with the bark attached are intended to be helpful in the recognition of trees from the outward appearance of the stems. Altogether, the school seems admirably well fitted and conducted to carry out

the objects for which it was established. To fulfill the requirements here a student must work not only with his mind in the acquisition of knowledge from lectures and books, but he must share, and intelligently perform under competent direction, the manual labor and management of the whole establishment, for, as already stated, no ordinary laborers whatever are employed.

The surplus products of the school in the way of flowers, fruits, vegetables or plants are sold to the public, and the income thus derived forms no inconsiderable item to the state toward defraying the expenses of the establishment. Prizes in cash amounting to nearly two hundred and fifty dollars each are awarded by the Minister of Agriculture to those students who graduate with the highest honors, and it is generally expected that this sum will be spent in furthering their studies in some horticultural centres, as in the Netherlands or England.

The institution would, no doubt, be greatly benefited and its practical value increased by the possession of larger grounds for experimentation and work. This may come in time. Meanwhile the students are abundantly supplied with interesting examples and object-lessons in the gardens and nurseries which are so abundant in the country about Versailles.

Arnold Arboretum.

J. G. Jack.

The Mountain Flora of Alabama.

THE following paper was read by Dr. Charles Mohr, of Mobile, Alabama, before the Botanical Club at the meeting of the American Association for the Advancement of Science at Rochester last August.

The investigation of the flora of the Appalachian Mountains of the southern states has been chiefly carried on in the central and most elevated parts of the mountain-chain. Little has been made known of the floral conditions existing in its extreme southern outliers, which in relation to the distribution of plants in the eastern part of this continent are invested with a peculiar interest. Many plants, chiefly at home in high northern latitudes, follow the summits of the mountains into the warmer temperate zone and find upon these spurs the limit to their southward progress, while a number of others are confined exclusively to a single locality, or less frequently to several isolated localities.

The following remarks on the mountain flora of Alabama are based on observations made during the earlier part of this season in the mountainous region bordering upon the Tennessee Valley, on Lookout Mountain, near the north-eastern corner of the state, on the extensive table-land of the Warrior coalfield, with its steep escarpment forming the southern border of the Valley of the Tennessee, and on the detached outliers of the Cumberland Mountains, which form its north-eastern border. The region corresponding in the character of its flora with the flora of the higher mountain region of the adjoining states of Georgia, North Carolina and south-eastern Tennessee is in Alabama entered at an altitude not exceeding 2,000 feet above the sea. In the Lookout Mountain region this is indicated by a *Rhododendron* proper, *R. maximum*, the frequency of various other *Rhodoraceæ*, *Ericaceæ*, *Vacciniums* and several species of *Ilex*. This region is further characterized by the large preponderancy of deciduous-leaved trees, the almost entire absence of *Magnolias* and of coniferous trees in general, particularly of Pines of a decided southern range.

The somewhat abrupt declivity of Lookout Mountain, rising to a height of from 800 to 900 feet above Little Wells Valley, is covered with a tall forest, chiefly of Oaks, the species of the White Oak group prevailing. But a short time ago, it was noted for the abundance of fine timber of White Oak (*Quercus alba*), and for the tan-bark derived from the Mountain Oak (*Q. prinus*), but these resources are at present almost exhausted. The Black Locust has in these forests been for the first time recognized as a truly indigenous tree in Alabama. In the deep shade of the high forest on these declivities, several tall umbelliferous plants strike the attention of the observer, among them being *Ligusticum actiæfolium*, *Angelica hirsuta*, *Thaspium pinnatifidum*, with *Pimpinella integrifolia* and *Zizia serrata* smaller in size. *Oxalis recurva* and *Polygonatum giganteum* are for the first time noted within the limits of the southern flora associated with *Anemone nemorosa*, var. *quinquefolia*, *Stellaria pubera*, *Galium latifolium*, *Asclepias quadrifolia*, *Trillium erythrocarpum*, *Disporum lanuginosum*, *Uvularia grandiflora* and *U. perfoliata*. Emerging from the high forest at the base of the cliffs of the lower carboniferous sandstone, which border the brow of the escarpment, the southern *Philadelphus hirsutus*, *Ilex Monticola*, *Viburnum dentatum*, *V. acerfolium*, *Rubus occidentalis*, *R. Canadensis* and *Celas-*

trus scandens frequent the sunny heights. On the rocky flats of the table-land, where neither shrub nor tree is able to gain a foothold, *Arenaria brevitolia*, *Talinum teretifolium*, *Sedum ternatum*, and *Opuntia Rafinesquii* fill every hollow and crevice. *Senecio aureus*, var. *Balsamitæ*, frequent on the borders of wood-lands, becomes by its abundance a troublesome weed in the pastures and fields. *Rubus strigosus* covers low grassy banks. The forests on the plateaus of Lookout Mountain are open, the Mountain Oak frequently prevailing with Scarlet Oak. Post Oak (*Quercus minor*) and Black Jack (*Q. nigra*), Chestnut and Hickories are less frequently met with, and the Scrub Pine, *Pinus Virginiana*, the only one of its kind found in this part of Lookout Mountain, is seen in greatest perfection in detached groups. The springy soil in the gentle depressions of the table-land is covered by a most luxuriant growth of beautiful shrubs, and these also shade the rocky banks of the water-courses. In the first of these situations abound *Rhododendron arborescens*, *R. nudiflorum*, *R. viscosum*, *Calycanthus floridus*, *Ilex Monticola*, *Vaccinium virgatum*, and a peculiar form of *V. stamineum*, three to four feet in height, and, on account of its large edible berries, known by the settlers as the Wild Gooseberry, while the rocky banks of the creeks are preferred by *Rhododendron maximum*, *Kalmia latifolia*, *Calycanthus glaucus* and by *Viburnum cassinoides*. This shrub from the Saskatchewan Valley and the north of New England, extending to the sunny hills of Alabama, overshadows on the banks of Little or De Soto River the *Sarracenia*s and *Eriocaulon*s common in the lower south, such as *Sarracenia flava*, *Eriocaulon gnaphalodes*, and *Lachnocaulon Michauxii*, which have established themselves on the grass and sedge covered sands thrown up on the banks of the stream. *Diervilla sessilifolia* is frequent on the rocky hill-sides of the narrow valleys, with *Coreopsis verticillata*, *Bigelovia nudata*, var. *virgata*, *Galax aphylla*, *Thalictrum clavatum*, *Viola rostrata* and *V. striata* on the rocky shaded banks moistened by never-ceasing rivulets. *Thalictrum dioicum*, *Asarum Virginianum* and *Saxifraga Virginiana* prefer rocky ledges and hill-sides covered by a drier soil with *Deschampsia flexuosa*, *Festuca nutans*, *Danthonia compressa*, *Eatonia Pennsylvanica* and *E. Dudleyi*. *Asplenium Bradleyi*, sparsely scattered throughout the Cumberland Mountains of Tennessee and southern Kentucky, has been found on the damp base of deeply shaded rocks. *Asplenium pinnatifidum*, *A. montanum*, *A. Ruta-muraria* and *Cheilanthes vestitata* prefer exposed cliffs, and *Adiantum pedatum*, *Aspidium marginale*, *Dicksonia punctilobula*, *Cystopteris fragilis* love shaded ravines.

Of the sixty-two species of vascular plants, outside of the forest-trees common everywhere, observed in this higher mountain-region, thirty-five, or fifty-six per cent., are most frequently distributed in the northern states; fourteen species, or twenty-three per cent., have a pronounced southern distribution, and twelve species, or little less than twenty per cent., are typical southern plants.

Descending from the higher mountain region to the table-lands and ranges capped by the conglomerates of the coal-measures, not exceeding in their average elevation 750 feet above the sea, the character of the vegetation changes with the frequent appearance of evergreen conifers among the deciduous-leaved trees of the forest. The Short-leaf Pine (*P. echinata*) crowns the ridges of a meagre and dry soil, and the Loblolly Pine covers the damp depressions, devoid of drainage, of the table-land; upon these swales, from a fraction of an acre to several in extent, this tree arrives at the best of its development and furnishes the greater part of the lumber-supplies drawn from this region. The Scrub Pine is here rarely seen, and the Mountain Oak much less frequently met with, while the Black Oak (*Quercus tinctoria*), Spanish Oak, Post Oak, Scarlet Oak, with the Chestnut and Mockernut Hickory, prevail in the closer soils of the table-land. Oaks of semi-persistent foliage, like *Q. uliginosa* and *Q. Phellos*, make their appearance in the coves and along the banks of streams; *Magnolias* take a prominent place in the forests of the elevated valleys beside the Black Sugar Maple, Ohio Buckeyes, huge Poplars, White Ash and White Oak. In a valley with such a tree-covering on Sand Mountain, near the western border of this region in Alabama, was *Magnolia cordata* discovered in 1880; a tree with characters but little understood before that time and its distribution involved in obscurity. From the Alabama specimen, it was evident that it was wanting in specific characters to separate it from *M. acuminata*, and it was hence admitted by Professor Sargent as *M. acuminata*, var. *cordata*, in the *Silva of North America*. On the rocky banks of the middle fork of Sipsey River, a tributary of the Warrior River, in connection with the valley in which the yellow-flowered *Magnolia* finds its secluded home, are found

groves of stately Hemlocks along the course of the creek to its junction with the main stream for a distance of from twelve to fifteen miles, where this tree reaches its southern limit. It is remarkable to find on this, its extreme and perfectly isolated outpost, the Hemlock associated with the Cherry Birch (*Betula lenta*), one of its companions in its northernmost home. Of trees of smaller size are to be mentioned *Oxydendrum arbo-reum* and *Halesia tetraptera*; of shrubs, the *Azaleas*, common in the higher region, to which are to be added *Stuartia pentagyna*, *S. Virginica*, *Ilex mollis*, *I. longipes*, *Robinia hispida*, var. *Elliottii*, *Andromeda ligustrina*, *Vaccinium virgatum*, *V. vacillans*, *V. arbo-reum* and a host of Hawthorns, *Cratægus spathula*, *C. coccinea*, var. *mollis*, *C. Crus-galli*. The rare *Dar-beya umbellata* is endemic in this lower mountain region of Alabama, Georgia and North Carolina, and it is only from the station recently discovered in the latter state that pistillate plants have become known.

The crescent-shaped cavities, worn by the action of running water in the perpendicular walls of sandstone enclosing the deep gorges and narrow valleys so frequently intersecting the table-lands, give shelter to the most delicate and rarest of Ferns; *Trichomanes radicans* covers with its rooting-stems the walls of these gloomy recesses, called rock-houses, dripping with moisture, never reached by a direct ray of the sun, protected against sudden changes of temperature and aerial currents. The tiny *T. Petersii*, forming dense mats resembling in its habit a Liverwort, is found solely in their darkest and most hidden recesses. On the threshold rocks to these caverns *Heuchera Rugelii* is chiefly found; and on the exposed sandstone rocks *Silene rotundifolia*, *S. Pennsylvanica* and a variety of Ferns, such as *Cheilanthes Alabamensis*, *C. tomentosa*, *Asplenium parvulum* and *A. pinnatifidum*. Fully twenty-five per cent. of the plants so far observed in this lower mountain region are very rarely, if ever, found north of latitude 36° 30', the line that separates the northern and the southern flora of eastern North America.

On the lower flanks of the mountains, where the outcrops of the mountain limestone form rocky declivities, and upon the calcareous lower hills the aspect of the flora is totally changed. The Red Cedar replaces the Pine among the deciduous trees, and in the most rugged localities occupies the ground exclusively, its dark foliage denoting in sharp outlines its presence at a distance. North of the Tennessee River in the openings of the dense Cedar-glades the surface of the flat rocks in the early days of spring is covered with the *Draba Caroliniana*, *D. brachycarpa*, *Leavenworthia Michauxii*, *Claytonia Virginica*, *Arenaria petula*, *A. serpyllifolia*, *Bellis perennis*, *Ranunculus fascicularis*, while the more open woods and copses of the hillsides, with a more varied tree-growth, present an array of herbs and annual plants rich in the varied hues of their flowers, such as *Sedum pulchellum*, *Cynoglossum Virginicum*, *Lithospermum tuberosum*, *L. canescens*, *Phacelia bipinnatifida*, *P. fimbriata*, *Salvia utricifolia*, *Scutellaria versicolor*, var. *mollis*, *S. serrata*, *Monarda fistulosa*, var. *mollis*, *M. Bradburiana* and *Opuntia Rafinesquii*, followed by the golden-flowered *Hypericum* (*H. aureum*) and *H. cistifolium*. Among the shrubs characteristic of the flora of these calcareous ridges are *Forestiera ligustrina*, *Rhus Canadensis*, and *Symphoricarpus vulgaris*, while among the trees confined in Alabama to the ranges of the mountain limestone among the outliers of the Cumberland Mountains are *Cotinus Americanus*, *Æsculus glabra* and *Fraxinus quadrangulata*. *Fraxinus Americana*, var. *microcarpa*, found to extend to the cretaceous hills in the centre of the state, occurs here with its fruit-bearing perfect seeds. This pretty tree, not exceeding twenty-five feet in height, with its widespreading limbs and drooping branches, can, therefore, not be regarded as a hybrid, and by the constant character of its fruit appears to be a proper species. As such it has been recognized first by Vasey, who, in his catalogue of the forest-trees of the United States, mentioned this tree under the name of *Fraxinus Curtisii*. *Cotinus Americanus* has been found on the summit of one of the highest limestone ridges near Gurley to cover tracts of several acres in extent, and there seems no doubt that this beautiful tree is found in such situations upon many of these detached spurs of the Cumberland Mountains in Alabama.

The three great functions of mountains—those of giving motion and change to water, air and earth—are indispensable to human existence. And thus those desolate and threatening ranges of dark mountain, which in nearly all ages of the world men have looked upon with aversion or with terror, are sources of life and happiness far fuller and more beneficent than all the bright fruitfulness of the plain. The valleys only feed; the mountains feed and guard and strengthen us.—*Ruskin*.

Plant Notes.

Aristolochia Sipho.

IN the illustration on this page is shown a fine example of the well-known Dutchman's Pipe, *Aristolochia Sipho*, as the broad leaves are seen relieved against the mat of Japanese *Ampelopsis* close against the walls of the house. The plant is striking here, but its luxuriant growth shows that it can be used to even better purpose where a covering is needed for a trellis or wall or wherever else a good thick screen is a desideratum. Although well known, the Dutchman's Pipe is much less frequently seen in gardens than would generally be supposed.

An inhabitant of the Allegheny region so rich in trees and shrubs, from Pennsylvania southward, it proves perfectly

This dense leafage pretty effectually conceals the curious brown-colored flowers, an inch and a half long, and of a shape resembling a siphon, or Dutch pipe, from which likeness the plant derives its specific and popular names. As the *Aristolochias* are without petals, the curious flower-tube is simply the calyx. The fruit is a six-angled, oblong capsule, two or three inches in length, and it is said that the seed does not long retain its vitality. Fruit seems to be uncommon or rarely produced in northern gardens. Where fresh seed is not available the Dutchman's Pipe may be propagated by layering or by cuttings in sand, under glass and with some bottom-heat.

We have many other vines, suitable for coverings or screens, whose foliage is more pleasing and graceful than this, which is somewhat coarse in appearance, but there is a solidity about it which makes it peculiarly appropriate in

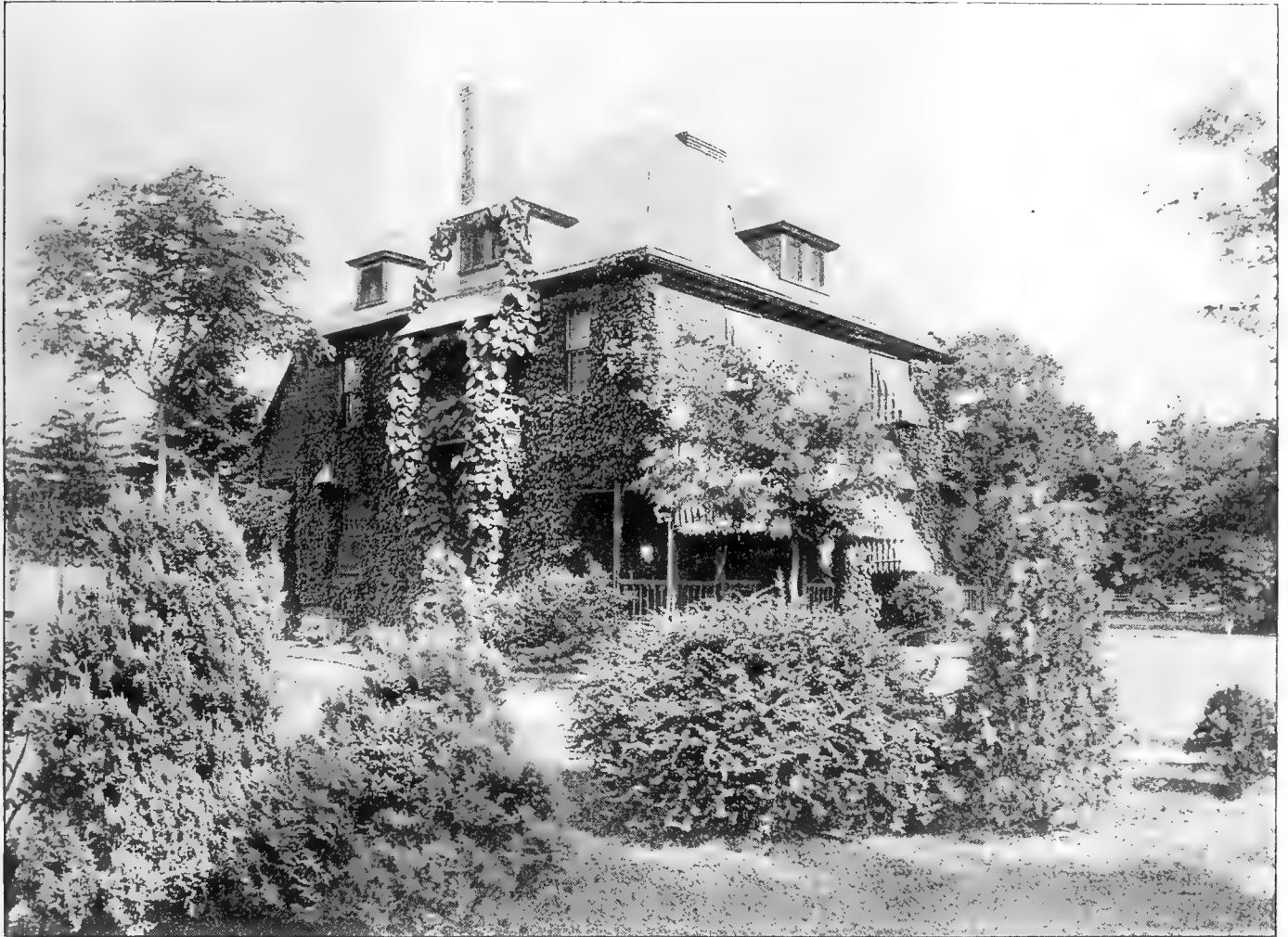


Fig. 86.—*Aristolochia Sipho* on the house of Mr. S. B. Parsons, Flushing, Long Island.

hardy in most parts of New England and will thrive even as far north as Montreal. In fact, the St. Lawrence Valley is much more favorable to plants of doubtful hardiness than many other regions farther south.

Aristolochia Sipho grows and thrives best in a deep, rich soil, and in most situations requires no protection in winter. As it is a twiner, and not a climber like Ivy, it will not grow up a blank wall without poles, wires or some other such objects, about and among which the stems may twine. The stems are very pliant and tough and may be freely handled or trained in any direction without fear of breaking. The very thick, large, roundish heart-shaped leaves are often a foot in length and eight inches wide, and when in full foliage the plant forms one of the most perfect and dense screens which can be grown on a trellis.

some situations. It seems to be very little affected by fungous or insect diseases.

Aristolochia tomentosa is another hardy species, with much the same habit as *A. Sipho*, but it is a much more slender plant, with lighter-colored and very much smaller leaves and smaller flowers of a brownish or greenish yellow color, with a deep purplish colored tube. The Dutchman's Pipe appears to be little, if at all, used medicinally as is the Virginia Snake-root (*A. serpentaria*) and others of the same genus, both in this country and the Old World.

The greatest number and the finest representatives of the genus are inhabitants of the tropics, and chiefly of tropical America. Figures of one of these were given in the third volume of GARDEN AND FOREST (pp. 598 and 599)

under the name of *Aristolochia grandiflora*, or Pelican Flower, which Mr. Watson of Kew afterward (vol. iv., 546) stated should be known under a different specific name, or *A. Gigas*. Large specimens of these blossoms, in cultivation, have measured eighteen by twenty-two inches across the face of the open flower, and, moreover, they are provided with a curious tail-like appendage three feet long. The forms of the flowers of these exotic species are quite as strange as in our Dutchman's Pipe, those of *A. Gigas* resembling a pelican or duck, especially when in bud. They seem to be constructed so as to entrap insects, and many of them give out a very strong and disagreeable odor.

We ought to add that our illustration is a view of the house of Mr. S. B. Parsons, of Flushing, Long Island, and that on another part of his grounds the *Aristolochia* which shows so well in this picture is used with great success to form such a screen as we have spoken of. In the pretty composition in this picture the tree at the left corner of the house is a thrifty young Kentucky Coffee-tree, which illustrates well the open character of its foliage at this stage of growth. The two plants in the foreground of the extreme left are a Japanese Juniper and a golden-tipped *Arbor Vitæ*. The compactly grown shrub in the centre is a good specimen of *Berberis Thunbergii*, and the plant at its right is a pyramidal *Arbor Vitæ*.

Yun-nan Rhododendrons.

THE current number of *The Garden* contains an admirable illustration of *Rhododendron racemosum*, which is a charming little plant, and since it is likely to be quite hardy in England, it will be a first-rate plant for the rock-garden. It is not more than nine inches high, with healthy bright green leaves an inch long clothing the entire stems. The flowers are terminal axillary clusters nearly an inch across, pale pink, margined with rose, and slightly fragrant. The plants in cultivation all came from the same batch of seeds, which were sent to Paris from Yun-nan by the French missionary Delavay. There is some doubt as to the correct name of this plant, but, whatever it may be, the plant is a welcome addition to our garden treasures. In fact, it seems that the Yun-nan Rhododendron may prove quite as useful in the garden as the Himalayan and Malayan species. Altogether there are some sixty-five species of Rhododendrons in China so far as is known, including such old species as *Rhododendron Fortunei*, *R. Dauricum*, *R. ovatum* and the so-called Indian *Azalea*. These Chinese Rhododendrons are not so magnificent as the giants of the Himalayas, but they have a charm of habit, flower and color which is their own.

New or Little-known Plants.

Cypripedium Warnero-superbiens.

THE new hybrid *Cypripedium* illustrated on page 511 was described in the *Gardeners' Chronicle* for September 10, 1892, by Mr. Robert M. Grey, gardener to Mr. H. Graves, Orange, New Jersey, in whose collection it has recently bloomed. This Orchid, *C. Warnero-superbiens*, was said to be intermediate between its parents, with foliage five inches long, acute, broad near the base, reticulated with dark green on a pale ground. The flowers are solitary, on pubescent brown scapes, the dorsal sepal proportionately large, white with radiating green nerves and a stain of vinous red across the centre. The inferior sepal is much smaller and of the same color. The petals are narrow, white, tinted with vinous red at the apices and closely veined with green, ciliate and warted on the margins, with an occasional spot on the surface, and some brown specks near the base. The lip is of a rich glossy brown color, slightly concave below the opening and speckled on the unfolded lobes. The staminode is pale green, with darker green reticulation.

New Orchids.

ODONTOGLOSSUM OWENIANUM, Rolfe.—A distinct and pretty *Odontoglossum* which flowered in the collection of Messrs. F. Sander & Co., of St. Albans. The sepals and petals are yellowish white, the former with the whole of the disk chocolate, and the latter with or without a chocolate blotch. The lip, which approaches that of *O. Pescatorei* in shape, is wholly white. It may be a natural hybrid. *Gardeners' Chronicle*, August 13th, p. 178.

ZYGOPETALUM GRAMINIFOLIUM, Rolfe.—An elegant little species allied to *Z. maxillare*, Lindl., with narrow leaves and an erect raceme of largish flowers. The sepals and petals are light green, heavily blotched with dark brown, and the lip of a uniform bright purple-blue. It is a native of South Brazil and was imported by Messrs. F. Sander & Co., with *Lomaria Boryana*, on the trunks of which it creeps by its slender rhizomes.—*Gardeners' Chronicle*, August 13th, p. 179; *Lindenia*, t. 339.

LÆLIA × *OWENIANA*, Hort.—A very pretty hybrid raised from *Lælia pumila* Dayana crossed with the pollen of *L. xanthina*. The sepals and petals are white, the tube of the lip bright yellow, and the limb dark maroon with a white tip. It was exhibited by Messrs. F. Sander & Co., of St. Albans, at a meeting of the Royal Horticultural Society on August 9th last, and received an award of merit.—*Gardeners' Chronicle*, August 13th, p. 191.

LÆLIO-CATTLEYA × *INGRAMII*, Hort.—A fine hybrid raised from *Lælia pumila*, var. *Dayana*, crossed with the pollen of *Cattleya Dowiana*. The sepals and petals are light rose, and the lip dark purplish crimson with an obscure lighter tracing. It was exhibited by C. Ingram, Esq., of Godalming, at a meeting of the Royal Horticultural Society on August 9th last, and was awarded a first-class certificate.—*Gardeners' Chronicle*, August 13th, p. 191.

VANDA VITELLINA, Kranzlin.—A species allied to *V. coerulescens*, Griff., but with yellow flowers of far smaller size. It was imported by Messrs. Seeger & Tropp, of East Dulwich, and flowered in the Royal Botanic Garden, Berlin.—*Gardeners' Chronicle*, August 20th, p. 206.

CATTLEYA × "BARONESS SCHRÖDER."—A hybrid raised between *C. Triance* and *C. dolosa* in the collection of Baron Schröder, of The Dell, Egham. The sepals and petals are veined and tinged with clear rose-pink, and the lip white with rose-colored margin and an orange throat. It was exhibited at a meeting of the Royal Horticultural Society on August 23d last, and was awarded a first-class certificate.—*Gardeners' Chronicle*, August 27th, p. 249.

EULOPHIOLLA ELISABETHÆ, L. Lind. & Rolfe.—A very interesting and handsome new genus, with something of the habit of *Catasetum*. It has an arching raceme of largish white flowers, with some maroon-purple on the back of the sepals and a deep yellow disk to the lip. The pedicels and the entire scape are of a deep lurid vinous-purple. It was introduced by Messrs. Linden, L'Horticulture Internationale, Brussels, and flowered in their establishment.—*Lindenia*, t. 325.

Kew.

R. A. Rolfe.

Foreign Correspondence.

London Letter.

PRUNUS JACQUEMONTII.—This is an interesting species of Plum, the introduction of which we owe to Dr. Aitchison, who sent seeds of it from Afghanistan to Kew, where it flowered in May, 1887, and was figured in the *Botanical Magazine*. It has fruited freely this year, and is now a conspicuous ornament in the Arboretum, the rich crimson fruits, as large as those of the Cherry Plum (*P. myrobalana*), being abundant on the twiggy spineless branches, upon which the brown tinted ovate leaves still remain. The fruits are in appearance as tempting as cherries, but their taste is not agreeable, being acid and astringent. The plant is, however, worth growing to look at. According to Hooker, it is the plant referred to by Brandis in his *Forest Flora*,

p. 194, under *P. humilis*, and described as a small glabrous shrub, with brownish gray bark, ovate-lanceolate, coriaceous, deep and sharply serrated leaves, fimbriate and often bifid stipules. It is found in the drier region of the north-west Himalaya, at an altitude of 9,000 to 12,000 feet. *P. Jacquemontii* fruits freely when small, plants less than a yard high being heavily laden with fruit, and it is quite hardy; it might be worth crossing with some of the garden plums, which would be improved in flavor by the addition of a little acidity. The stone of the fruit is small, nearly globose, and almost smooth.

PUNICA GRANATUM, var. *NANUM*.—This is a charming little shrub, which, in England, is much superior to the type, as it flowers freely, whereas the latter does not. In some German towns the dwarf Pomegranate is a favorite deco-

dense raceme of white flowers half an inch long; the tube is constricted at the base, then widening upward, and divided at the top into six regular segments; filaments a little longer than the tube, anthers yellow. This plant is a native of Griqualand, east, at an altitude of 6,000 feet. It may prove to be quite hardy in England. It is pretty when grown in pots in a greenhouse, and thrives in a sunny border in the open air, where, as well as in the Cape-house, it is now in flower. It is sure to receive the attention of those specially interested in Kniphofias.

GERBERA JAMESONI is still flowering in a sunny border in the open. The flowers, though a less brilliant scarlet, are quite as large as those produced in midsummer. Several years are necessary for this really beautiful Cape Composite to become established, but it is quite worth waiting for.



Fig. 37.—*Cypripedium Warnero-superbiens*.—See page 510.

rative plant, being grown and used as *Solanum capsicastrum* is here. At Kew it is planted outside in a sunny border, where it grows to about one and a half feet in height, and now, in October, it is covered with beautiful scarlet fleshy flowers. Lifted and planted in pots these little shrubs are most useful for the conservatory. The flowers are double.

KNIPHOFIA MODESTA.—This is a white-flowered species, which was named and described by Mr. J. G. Baker, in the *Journal of Botany*, 1889, p. 43, and of which plants and seeds have this year been sent to Kew from Natal. It is a pretty plant, with linear keeled leaves a yard long, glaucous green, smooth-edged and soft in texture. The peduncle is slender, erect, three feet high, the upper foot a

The handsome green leaves and stout blooms produced by vigorous plants are much superior to those on a weak plant. In a sheltered sunny corner plants of it have now stood outside, winter and summer, for three years without suffering any apparent injury from cold. I consider *G. Jamesoni* one of the very best of the newer introductions from South Africa. Unfortunately, it has so far failed to ripen seeds here, and, as it grows slowly, division of the root-stock is not a quick means of working up a stock. Nevertheless, it is a plant worth looking after. Each flower is two and a half inches across, colored the most brilliant scarlet, and it lasts at least a month.

NYMPHÆA MEXICANA.—We have several times had tubers of this plant from American correspondents, but in each

case they have turned out to be *N. gracilis*, a white-flowered species not unlike the white *N. stellata*, which was distributed a year or two ago as *N. Voalefoka*. A tuber of the true yellow-flowered *N. Mexicana* sent to Kew would be most acceptable, and, if the sender desires, the gift would be reciprocated. The Floridan *N. flava* has been in cultivation at least ten years here, but it flowers only rarely. I am told that *N. Mexicana* is much freer in bloom, and also a darker yellow, than *N. flava*. The seeds of these plants retain their vitality several years if kept quite dry in a packet. Some growers I know keep them in water in bottles, but the effect of this is to make all germinate within the year.

EUPHARIS STEVENSII.—This plant is supposed to have originated from *E. candida* crossed with *E. Sanderi*, but, judging by a plant of it now in flower at Kew, it scarcely differs from *E. Sanderi*, of which a figure will be found in the *Botanical Magazine*, t. 6676. I am inclined to believe that nearly all these so-called species of *Eucharis* are merely seedling forms of one variable species. If any one will take the trouble to raise *E. grandiflora* (*Amazonica*) from seeds he will probably get plenty of variations quite as pronounced as those shown by such questionable species as *E. Sanderi*, *E. Mastersii*, *E. Bakeriana* and *E. candida*. There is only one really first-rate *Eucharis*, and that is the common *E. grandiflora*; the rest may be called more or less inferior varieties. It is remarkable that the habitat of typical *E. grandiflora* has never been found since it was first discovered by Triana, who sent to Linden in 1854 the bulbs from which all the thousands now cultivated have sprung.

THE BELLADONNA LILY.—I have more than once written of this plant as one of the first attractions in the borders at Kew and a few other English gardens in autumn. There are now several hundred spikes of flowers on a south border against the Orchid-house here, where they make a rich glow of rose-red color. I write now to recommend growers of bulbs in America to take up the Belladonna and raise it from seeds. Hitherto we have relied solely on bulb offsets for the multiplication of this plant, consequently we have not improved it at all. That it is capable of considerable improvement by means of seeds and selection is evident from a plant, a seedling, flowering at Kew now. This plant was obtained several years ago as a probable hybrid between the Belladonna and *Brunsvigia Josephinae*. On flowering, however, it proves that the supposed cross did not take place, the plant being unquestionably a pure Belladonna. But such a Belladonna! The scape is as thick as a man's thumb, a yard high, and it bears an umbel of twelve flowers all open together, half as large again as the ordinary form, and colored a rich rose-red, very nearly crimson. Every one who has seen this plant declares it the finest Belladonna Lily ever seen. We propose to call it variety *Kewense*. This *Amaryllis*, which, by the way, I may observe, is the only true *Amaryllis*, has been in cultivation since 1712, when it was introduced from South Africa.

We do not employ the seeds of bulbous plants for purposes of propagation nearly as much as we might. Cultivation, in a garden sense, generally has the effect of improving plants, but it is only when the plants are raised generation after generation from seeds that the law of variation is called into action. Branch or bud sports are extremely few and rarely occur, but seedlings often show a great deviation from the parent.

London.

W. Watson.

Cultural Department.

A Few Neglected Grapes.

IN our ambition for new sorts and improvements we are apt to overlook some of the best of our old fruits. This is especially true of Grapes. Among white Grapes I doubt if we have yet one which, altogether, is more worthy of a place of honor than Martha. It grows well, and when dead-ripe is sweet and refreshing. It has no hard pulp, and is not over-

supplied with seeds. The berries stand out well shouldered, and get to be a fine translucent greenish white. In quality it is far ahead of Niagara, and in ripening much more reliable than Diamond. Nor is it inclined to any disease. For three or four years Martha has grown in favor with me.

Hayes is a richer grape than Martha and two weeks earlier, but it is not a good grower nor an abundant bearer. I think it decidedly the highest-flavored of our white grapes that I have tested for vineyard culture. In this respect it has but two rivals, Eldorado and Lady, neither of which gives good crops, as a rule. Lady is earlier, and, if a good cropper, should be rated as the most remarkable of all our grapes for quality and earliness. Eldorado is later, and of very fine quality; Hayes intermediate. But from the first translucency Hayes is sweet enough to eat, which cannot be said of most grapes, especially of Diamond.

A third grape liable to be crowded out is Duchess. This is a pure, sparkling, crisp grape, never sugary, but rich and very satisfying. My children select the Duchess from forty varieties. A disadvantage of this grape is that you cannot easily tell when it is ripe, and if left on the vines when ripened cracks and decays. It is not a good market grape, while very desirable for home use. There is no more prolific Grape; it bears huge bunches as handsome as hot-house varieties. The bunch is very compact, and is very rarely touched with rot.

Brighton should hardly be noted as likely to be crowded out, for in some quarters it is getting new attention. But there is for the vineyard, in my judgment, not one finer Grape than Brighton. The bunches are very large and handsome, just compact enough, and of most delicious quality. When planted alone it is a barren vine; when alternated with Niagara, Pocklington, Worden or Duchess it bears marvelously. It is capable of wonderful crops. The grape is, however, not a good keeper. Its parent (*Iona*) is, on the contrary, one of the best keepers. I shall steadily throw out a large number of varieties, replacing with Brighton.

Golden Pocklington is another worthy Grape that has been crowded too hard by Niagara, and deserves to be replaced in a selected list. It is a large grape of good quality, decidedly better than Niagara. If closely pruned it ripens about the same time as the Concord. Its tendency is to bear very heavily, with fine compact bunches; it has little inclination to any sort of disease.

A Grape rarely mentioned is August Giant; it is huge and of enormously rampant growth. The vine is very healthy and very hardy, and will cover a barn in five years. The bunches resemble Herbert, and the flavor is excellent. The skin is thick, and the grape is a good keeper. I have seen some tendency to mildew in shady places, but not much. I should class it with Herbert, although it is far from being as good as that magnificent fruit. Herbert is not a perfect self-pollinizer, but does fairly well. I plant Duchess with it. The flavor is pure, and there is no sour core. The skin is very thick; it is a good keeper.

One more overlooked Grape is Goethe (*Rogers No. 1*). It deserves to rank number one for all reasons. No other *Rogers* hybrid surpasses it, if any equals it. As far north as this it cannot be grown in vineyards; but a few degrees to the south the Goethe is the most delicious of the meaty varieties, as *Iona* is of the juicy sorts.

Clinton, N. Y.

E. P. Powell.

The Vegetable-garden.

OUR first sowing of the rose-colored Chinese winter Radish is now in use (October 15th), and our last sowing of seed of the same was made to-day. This sowing will be in use the greater part of the winter. Those who are fond of radishes should always use this variety in autumn. To many people it is better than most summer sorts. Those who have never used Radish-tops as a salad or as boiled "greens," should know that in a young state the thinnings of the crop make an admirable salad, cut up root and top together, while the more matured tops boiled with a bit of bacon are relished by any who are fond of "greens." One great advantage is the short time required to get a crop of greens for the table. Kale and Spinach, sown at the same time with these fall Radishes, will not furnish leaves for boiling for some time to come, and in the mean time the Radish-tops are useful, and, to my taste, much better than any kale. In northern localities these winter radishes should be lifted and stored before hard freezing sets in. Here the best plan is to mulch them with straw or pine-leaves to protect the soil from freezing, and they can be pulled as needed.

We were quite pleased with our little experiment with the English Broad Bean as an early green vegetable. Our seed was planted in a sunny situation in January. They soon came

up and grew with the utmost indifference to the weather. In fact, they were subject to quite hard-freezing when in bloom without injury, and the green beans were ready for shelling before the early peas. Some folks laughed at the idea of eating "horse-beans," but I found them quite palatable while green. They soon succumbed to warm weather. The Italians here use them largely, planting in December. We would advise a trial of these, planted at the usual time for planting English Peas in the north.

The time for storing cabbage for winter in the colder sections is near at hand. Some like to keep the stalks over for sprouting spring greens. For this purpose heel the cabbages in a furrow and pack the earth well around the base of the head. Pack the rows closely together so as to make compact beds five or six feet wide. Then thatch them over closely and thickly with evergreen boughs, and they will usually winter well. When no account is taken of the stalks, plow out a deep furrow in a dry place and place the cabbage in it root upward and the leaves of the head well tucked under. Then plow furrows from each side, and finish with a sharp and smoothly patted ridge over the row. This I consider the best method in any locality where a zero temperature occurs. Here the most expeditious way is to turn each cabbage on its side without pulling it up. Turn the head toward the north, and then cover the stem and base of head with earth. This should be done just after Christmas.

On the approach of winter, if your vegetable-garden soil is of a clayey character, you will find your spring work greatly facilitated, and the soil in much better condition all the next summer, if it is thrown into sharp narrow ridges with a plow, and left thus all winter for the frost to act upon it. These ridges will get very mellow, and will dry out earlier in spring than a flat surface, and they can be worked down and planted a week or two sooner than the land of your neighbors who do not take this precaution. It is easy enough to beat folks northward of you in earliness of products, but the skill of the gardener is best shown by the foresight which enables him to get in advance of his immediate neighbors.

We have now (October 17th) green peas in great plenty from a sowing of Premium Gems in August. There has been but one good rain since they were planted, and yet the vines are fresh and green and clear of any signs of mildew. Yorkshire Hero is just in full bloom, and may do better than the Gems if we have rain soon and frost does not put in an appearance too heavily. The Premium Gem and other early Peas can be relied upon for a fall crop almost anywhere north if sown in August. Ours would have been over long ago if the weather had been favorable. To my surprise I have never seen here any signs of mildew on fall-sown Peas, while in Maryland it gave us some trouble every fall. We sow these fall Peas in a deep furrow, cover lightly, and work the soil in level as they grow.

We have just sown one crop of Onions, chiefly the Italian varieties. They are sown very thickly on ridges slightly elevated above the surface. These will be transplanted early in February. Northward this sowing may still be done in cold frames, and the transplanting done in March and April. Onion-seed sown here last February in the open ground produced a fine crop, but we think the fall-sowing will give a larger one.

Raleigh, N. C.

W. F. Massey.

The Crown-bud of Chrysanthemums.

THE proper selection of the crown-bud is of vast importance to all who grow Chrysanthemums for specimen blooms. There is a great deal of doubt, especially among amateurs, regarding its identity. There are, however, certain well-marked characteristics, which, when once recognized, can hardly be mistaken. Although many of our finest blooms are the result of a crown-bud, it is yet an abortion at best, and if left to nature would seldom, if ever, develop. It always appears singly as a terminus to the stem, subtended by two or more lanceolate bracts. In the axils of the leaves, immediately below it, are two or three prominent shoot (never flower) buds, which commence to grow at once. If the bud is not desired, and it sometimes appears in May, as in W. H. Lincoln and Viviani Morel, one of the shoot-buds is allowed to grow, and in a little while the crown dwindles away. The majority of Chrysanthemums show their first crowns from the middle of July to the end of August. According to the experience of several large growers, whom I have visited lately, it is safer to discard all buds which appear before the 5th of August. A good percentage of these will produce what is known as the "second crown" by early September—say between the first and twelfth. A good terminal bud—the last bud to form, and which, by the way, is always subtended by other flower-buds,

often arranged in a cluster—is better than a poor first crown-bud, and generally develops, if not so large, a better-finished flower. Experience alone will show which to take, and it would be well to watch all new varieties in this respect, as well as to note the height they attain on any particular bud. I recently noticed a very even lot of the superb new white variety, Mrs. E. D. Adams, on first crowns, and Rohallion and V. H. Halleck may also be mentioned as being remarkably good. Domination is best on a second crown, while Miss Annie Manda and G. W. Childs are better on either second crown or terminal than on the first. Viviani Morel shows well-formed heads on second crown-buds, but produces flowers of better color and finish on terminal buds. A long list might be made with reference to the value of the different buds, which would be of great service another season.

There is much difference of opinion as to the best time to plant Chrysanthemums. For exhibition blooms all agree that early planting, say by the 15th of June, is best. This gives a longer season of growth and fits the plant to carry a larger bloom. The main objection to early planting is the liability to show crowns too early, say by the end of July, which must be discarded. This means two or more feet of additional height, an inconvenience where head-room is scarce.

There is no doubt that, for commercial purposes, late planting, from July 12th to 20th, is best. Very few of the ordinary first crowns will appear, the buds being about equally divided between second crowns and terminals.

The Chrysanthemum has not reached the zenith of its fame. Its popularity is great, and while it is increasing it is pleasing to notice there is no confusion. Every year growers become more and more critical, and do not hesitate to throw away a variety, no matter how good it may have been, when it is superseded. Although size has hitherto been the aim, refinement is now demanded, and this we see in many of the recent introductions. It is yet too early to speak of all, but in my opinion Mr. John Thorpe's G. W. Childs is the best novelty of 1892. Mr. Hicks Arnold and Mrs. E. D. Adams are flowers of great refinement and beauty, and will be sure to stay. Miss Annie Manda will surely displace Mrs. Alpheus Hardy, at least for commercial purposes, as it grows more freely and is certain to give a good percentage of marketable blooms.

Wellesley, Mass.

T. D. H.

Begonia gracilis.

BEGONIA BICOLOR is the latest addition to the varieties of this interesting and beautiful species, and seems to have been first offered by V. Lemoine & Sons in the autumn of 1891. At present flowering, the plant is very distinct. The leaves are thick and of firm substance, with numerous fine channelings. The color is a dull green with dull white spots, and silvery on the reverse. The stems are thick and succulent. The flowers are, as usual in the type, borne on short axillary peduncles, and are pink and four-petaled. As yet the variety has not sent out any of the thin graceful shoots which, when filled with flowers, help to render the other varieties so attractive. *B. gracilis* is a Mexican species, and I believe the varieties are also natives of that republic. It is usually grown under the name of *B. Martiana*. Mr. C. C. Pringle, in a note in GARDEN AND FOREST, vol. i., p. 7, notes that it grows in a region where the earth freezes and snows fall, and it should be quite hardy. The tubers are round, or sometimes elongated, with smooth white skins. The stems are succulent, and the main one eighteen inches to two feet high. Strong bulbs also throw several shorter ones in addition and numerous axillary ones. The flowers are male and female, rosy pink, and borne on short peduncles. The short branches noted above make very beautiful sprays for cutting, though the species is most useful for the summer decoration of the greenhouse.

Begonias are plants which are readily and rapidly propagated, as a rule, and nature has endowed *B. gracilis* with a full measure of means for its perpetuation. The bulbs when dormant seem to be indifferent to either dryness or moisture and throw off offsets. This plant is an abundant seed-bearer; the stems will strike root, and in the axils of the leaves a plant will bear hundreds of bulblets like mustard-seed, which may be used as seed. Such a plant has many chances for life under the most discouraging environment. The young plants which spring up in the earth on the greenhouse-benches seem usually true to the type, but I have a plant with an elongated bulb bearing flowers which are all female and much darker than the type, and evidently an hybrid.

Begonia grandiflora is evidently a selection with larger flowers. *B. diversifolia* is a smaller-growing kind, with darker

leaves and more numerous branched. *B. racemiflora* is a variety very much like *B. diversifolia*, and, as grown by me, I do not understand the reason for its distinctive name, the habit of flowering not being different from that of the type. Under the name of *B. Martiana pulcherrima*, Messrs. Lemoine offer a variety, said to be a seedling of *B. Martiana grandiflora*, with large deep carmine flowers and red stems and purplish leaves. Messrs. Pitcher & Manda have a form with finely cut and silvery spotted leaves which seems to be still unnamed, and which has not yet been distributed. These plants require positions well up to the glass, or they become somewhat drawn. The culture is the same as that of other summer-flowering tuberous-rooted Begonias.

Elizabeth, N. J.

J. N. Gerard.

The Ornamental Value of Sedges.

I HAVE long thought that Sedges or Carices will some day be considered valuable ornamental plants, and I have begun their cultivation for that purpose. I have just seen an excellent example of their value in the unique botanic garden at the Michigan Agricultural College, where Mr. C. F. Wheeler, who is a most ardent lover of wild plants, and of Sedges in particular, has collected many of our native species. Two distinct types of decorative value are to be seen in these Sedges, one being the free and unique character of clumps shown in the tall-growing and large-spiked forms, the other being the compact and bunched habit of leafy-based species, which are suitable for use in borders. Among the tall species, Mr. Wheeler regards the common *Carex crinita* as one of the best. It grows readily in any low or moist place, as do most of the species, and its tall spreading culms and swinging spikes form a striking object. Other species of similar habit are *C. monile*, *C. utriculata*, *C. lurida* and *C. Tuckermani*, all of which are common in many parts of the country.

Large clumps of any of the strong Carices are unique objects, if grown in a somewhat isolated position, so that the individuality of the species can be seen. Among those species which may be called border Carices, the low broad-leaved kinds are most useful, and these vary so widely in color and habit that excellent effects can be produced by them. Some of them possess a rich glaucous blue color which is very striking. One of the best of the blue ones, especially for sunny positions, is *Carex granularis*, and *C. laxiculmis* is also good. Other excellent native broad-leaved stouling species are *C. plantaginea*, *C. laxiflora*, var. *latifolia*, *C. platyphylla* and *C. Careyana*. All of these succeed in rich loamy soil, and although they usually reach their greatest perfection in half-shady places, if the soil is moist they do well in full sun.

Cornell University.

L. H. Bailey.

Correspondence.

Some Remarkable Plants in San Diego.

To the Editor of GARDEN AND FOREST:

Sir,—The remotest south-western city in the United States has just been celebrating the three hundred and fiftieth anniversary of the discovery of California. Everybody and everything has been laid under contribution to make the best display, so that the celebration from every point of view was successful. Garden art is still young here, and yet horticulture contributed to the decoration of arches, streets and buildings most effectively. Palm-leaves were largely used, and beautiful flowers and choice plants ornamented many of the small gardens surrounding the houses. Among plants worthy of special notice was a *Corypha Australis* with a slender trunk and a huge crown of leaves more than thirty feet high. There were fine specimens of *Seaforthia elegans* twenty to twenty-five feet high, one of them in flower; *Cocos Australis*, in flower also, was most conspicuous for its glaucous foliage; fine fruiting plants of *Erythea edulis*, the Guadalupe Palm, were observed, of which not much is known in the eastern states, and even less in Europe. This is one of the best fan-leaved Palms, and is sure to become a general favorite for its elegance of habit and boldness of foliage. A few specimens of *Erythea armata*, the Blue Palm, were seen. These, though twenty years old, were not very tall, growing more slowly even than *Chamærops humilis*. Besides these there were a numberless host of commoner Palms, such as *Phoenix dactylifera*, *P. reclinata* and *P. Canariensis*, *Washingtonia filifera*, *Chamærops excelsa* and *C. humilis*. These, including the *Seaforthia*, stand full exposure to the blazing sun without damage to their leaves, as happens so often in less hot countries. This is remarkable, and not easy to be accounted for; its cause

must be sought in the telluric and climatic conditions of this privileged country, where one is surprised to see *Poinsettias* growing side by side with *Hollies*, and *Yews* with *Apple-trees*, *German Medlars* and *Raspberries* ripening their fruit next to *Bananas*, *Pineapples* and *Cherimoyers*.

Many interesting plants are to be seen at the far-famed Hotel del Coronado on the narrow peninsula encircling the beautiful bay of San Diego. The spacious court-yard, laid out as a garden not more than six years ago, contains two magnificent specimens of *Cocos plumosa*, thirty to thirty-five feet high; two *Seaforthias* of about twenty feet; a unique specimen of *Kentia Forsteriana* fully fifteen feet high; younger specimens of other Palms, flowering shrubs of many kinds, and a luxuriant growth of climbers, among them the large-flowered and large-leaved *Aristolochia Bataviensis*, *Stephanotis floribunda*, profusely blooming all the year round, but at its best in winter; *Phaseolus Caracolla* and *Ipomœas* and *Bignonias* in variety.

Los Angeles, Cal.

E. F. Franceschi.

Apples Exempt from Scab.

To the Editor of GARDEN AND FOREST:

Sir,—While the blights from fungi have taken nearly every variety of old kinds in our orchards, we are glad to report that those which have a Russian origin are here almost entirely exempt. The thick-leaf characteristic of this class of fruits seems to resist the fungoid diseases, and, with the exception of *Tetofski* and *Zusoff*, have given a full crop of fruits. *Duchess of Oldenburg*, where it carried a heavy crop last year, gave but little fruit this year, but the foliage is very healthy and good. *Alexander*, an old Russian, gave a much better crop than usual. *Red Astrakhan* is all right. *Red Wine* gave us the finest crop we ever had, and they are the handsomest apples I ever saw in a collection of two hundred kinds. This is a new Russian, ripening in September. *Longfield* is probably the most profitable of the new Russians. In eighty varieties, this, on trees four years planted, literally trailed its branches on the ground with nice clean fruit, and the foliage is untarnished. *Yellow Transparent* is also a success, to which there are no objections unless the twig-blight shall injure it farther south; the leaf-blight does not seem to trouble this excellent summer Apple. *Hiberna* is another successful Russian, and I might mention fifty kinds that are successfully withstanding the leaf-blights and scab in this unfavorable year.

We have in Wisconsin a number of seedlings that are carrying their fruit and foliage this year, among these *Wolf River*, which we suppose is a seedling of *Alexander*, also *McMahon*, supposed to be of the same origin. This last is somewhat scabbed in fruit, but the foliage is but little injured. *Avista* is another promising seedling which has not failed a crop in twenty years. We are propagating *Peerless*, one of *Minnesota's* pets, and the foliage is as clean and healthy as that of *Duchess of Oldenburg*. Here at *Janesville*, the *Duchess* has brought to market as many bushels as the best ten varieties of our standard Apples, and it would not be extravagant to say more than all other kinds, but, with the present outlook, *Longfield* will pay better, tree for tree and acre for acre.

This season we found a tree of small white apples which bore two barrels, and was so free from scab, blights and attacks of insects that it attracted our attention, and we exhibited branches with their fruit at our state fair. This tree stands in a pasture where we did not spray at all either for insects or scab, and it may possibly be of value, although the fruit is no larger than *Little Red Romanite*; season October and November; very fine for cooking.

What I should like to urge upon the readers of your paper is to take notes of valuable seedlings and of any variety that pays this off year, and bring such to the notice of their state and local societies and help develop those kinds that are promising. We believe the seedling crosses of Russian Apples with our best native varieties will produce the paying crops of the near future. *Patten's Greening* and *Iowa Beauty* are very promising seedlings along this line; the foliage is perfect and the fruit very desirable.

Janesville, Wis.

George F. Kellogg.

Why do Fruits Drop Prematurely?

To the Editor of GARDEN AND FOREST:

Sir,—Is it not possible that the dropping of the little fruits mentioned in Professor Bailey's article on *Apple Scab*, p. 490, may be partly caused by lack of efficient pollination due to rainy weather at blossoming-time, which interferes with the usual transfer of pollen from flower to flower by insects? In some dwarfed Apples which were examined last summer no

seeds were found, and in others the seeds were few or abortive, indicating lack of efficient pollination. I see no reason why the failure of Apple-fruit to develop may not result from lack of efficient pollination, as was shown to be the case with Grapes in the article on self-pollination, p. 451. It is well known that pollination from an uncongenial source, while not resulting in well-developed specimens of fruit, still may incite the growth of little fruits, which soon drop away or persist in an abortive or dwarfed condition. It may be true that the dropping of the little apples was not due to lack of efficient pollination, yet there are reasons why this may well be considered as one of possible causes. It was shown by M. B. Waite, in a paper presented at the Rochester meeting of the American Association for the Advancement of Science that certain varieties of Pear are incapable of fertilizing themselves. A few tentative experiments made by Dr. Halsted,* Professor D. G. Fairchild† and the writer indicate that excessive rainfall at blossoming-time may seriously interfere with the setting of fruit in the case of Apples and Pears, and, in a less degree, of Grapes. In many orchards last spring, however, the rainy weather did not prevent the trees from setting full of fruit, but in a short time most of it fell off. Some experiments of the writer in cross-fertilization and self-fertilization of the Apple lead him to suspect, as suggested by Mr. Waite and as proven to be the case with Grape and Pear, that certain varieties of this fruit also can fertilize their own blossoms only in an imperfect way.

Agricultural Experiment Station, Geneva, N. Y.

S. A. Beach.

Warm Water for Tender Nymphæas.

To the Editor of GARDEN AND FOREST:

Sir,—I agree fully with Mr. James Brydon when he says "the best Nymphæas are grown in deep water," instead of a depth of six or eight inches as sometimes practiced. The most difficult problem to solve, however, is how best to heat the water to a depth of two to three feet below the surface. I have maintained for some years ponds for the cultivation of tender Water Lilies and *Victoria Regia*, using the ordinary system of hot-water heating by taking the supply to the heater from the bottom of the pond and returning heated water about eighteen inches below the surface at the opposite side of the pond. The plan is a fair one, if no better means can be devised, but the objection is that the hot water ascends to the surface immediately on being discharged and the temperature of the water one foot below the surface is generally very much below that at the surface.

Now I have a plan, new to me, that I propose to try next season. A large steam boiler used for power is within three hundred feet and it is proposed to take a steam pipe through a small brick conduit laid underground, the pipe being well covered with a good non-conducting material and then the bricks laid in cement to cover. Coils of one-inch galvanized iron pipe will be laid on the bottom of the pond, or rather the pipe will be laid round in increasing circles, and the condensed steam will be taken away by a pipe out of sight or it can be utilized to raise the water, or make up any leakage or evaporation. A large bulb of mercury is to be arranged so that by expansion or contraction the steam will be turned on or off. The pond is forty-two feet in diameter and three feet six inches deep, but it is confidently believed that by having the source of heat at the bottom in the form of hot steam pipes the problem will be solved. If any one who may read the views here expressed knows any reason why the plan is not a good one I should be pleased to hear it.

Northampton, Mass.

W. W. Lee.

A Unique Chrysanthemum Show.

To the Editor of GARDEN AND FOREST:

Sir,—Los Angeles has, in the last six or seven years, won a reputation for flower-fêtes that can scarcely be excelled in magnitude or beauty anywhere in the country. In April of each year the Flower Festival Society, a band of philanthropic women, gives a fête which fills a large pavilion. Later, the professional and amateur gardeners of southern California have their annual exhibit, and for three years the Chrysanthemum has been exhibited on a large scale by the women of one of the churches.

The two Chrysanthemum exhibits previously made were in spacious halls. Last spring a plot of unoccupied ground ad-

joining the church was secured. This space, 140 by 165 feet, was placed in the care of a Japanese gardener, who laid it out in beds and winding walks, with reservations for a dozen booths, and planted it with over 10,000 choice Chrysanthemums. An immense cloth tent was placed over it, and here, during the fête, was a scene pronounced by many visitors to be the most beautiful they had ever beheld, even in this land of wonderful flower-shows.

Directly opposite the entrance a miniature mountain-range extended, its sides covered with verdure, and its cañons filled with flowers, while on the summit pure white blossoms were massed. Passing around this sierra one came upon a tiny lake bearing rare aquatic plants upon its bosom. The pretty booths were entwined with climbers, mostly Sweet Peas in various colors and Smilax. The smooth broad walks, winding as in a maze, separated gorgeous beds of Chrysanthemums, some in shaded colors, others of a single hue. Nearly 300 varieties were represented in the garden. From the frame-work supporting the tent were suspended flags and streamers of all descriptions such as are used in Japan. The pillars were covered with a luxuriant growth of the Moonflower-vine in blossom, and the surrounding fence was concealed and transformed into a thing of beauty by clinging Morning-glories. At one side of the garden was a Japanese hut, made entirely of bamboo, and thatched with grasses in the style of that country. Outside its door were bamboo-tables holding tea-services in Japanese ware, and here a cup of the genuine oriental article, served with joss-sticks, could be had.

Besides the thousands of Chrysanthemums growing in the ground, the property of the ladies, there were many fine specimens in pots sent by florists in competition for the prizes offered. There were also about 2,000 Aster-plants, and many Dahlias, Cosmos and Carnations. All the plants belonging to the church were for sale at the close of the exhibition.

This show, without doubt the most extensive outdoor exhibit of Chrysanthemums ever made in this country, it is pleasant to know was a financial success as well as a means of pleasure and instruction for the public.

Los Angeles, Cal.

Clara S. Brown.

Periodical Literature.

An interesting article in the October number of *The Atlantic* is Professor N. S. Shaler's "Betterment of our Highways." We may not fully endorse his opening remark that "Perhaps the best of the many measures which may be applied to modern states to determine the degree of advancement to which they have attained may be found in the condition of their common roads." For this naturally leads to his conclusion that, "judged by the standard of our local ways, America as a whole must be regarded as the least advanced of all the countries which are commonly classed as civilized." But Italy, for example, has better common roads than ours; yet if "advanced" is taken in any really general sense, few persons will assert that Italy is more advanced than the United States. Professor Shaler acknowledges, indeed, to a fact which has already often been pointed out—that the newly born railway was an extremely detrimental influence upon the extension of good common roads in this country. But we think he might have laid some emphasis upon this fact as mitigating our still-too-evident sins in the matter of common roads, and entitling us to consider ourselves more civilized than some other nations whose roads are better.

However, this is a minor point. For the most part what Professor Shaler says is so true, and has so long been true, that it is a disgrace as well as a wonder that any one should have to say it again to-day. But it must be said to-day and to-morrow and the day after to-morrow, by many voices as often as they have opportunity, if the public at large is to be awakened to a vivid realization of an evil which means an active concerted effort for its abolition. Therefore, Professor Shaler's article is very welcome as one of the clearest and best expositions of the subject that we yet have seen. He does not waste time in describing how bad most of our roads are; he devotes his attention chiefly to showing how they may be improved. His explanation of the extreme difficulty of good road-making—which means, not the persistent use of one consistent scheme, but the perpetual adaptation of sound fundamental ideas to very different local conditions—ought to show our legislators and our educators how necessary is thorough training in the art of road-making if good roads are to come in all parts of our country. Nothing could be more evidently true, yet nothing could more insistently need saying, than that "the first step toward our new dispensation is to persuade our greater schools to undertake the systematic education of road-

* "Influence of Rainfall at Blooming-time upon Subsequent Fruitfulness," p. 230, *Annual Report N. Y. Exper. Station, 1890.*

† "The Effect of Rainfall upon Pollination." Paper presented before the last meeting of the American Horticultural Society by D. G. Fairchild and S. A. Beach.

masters, giving to the task the same care which they devote to the preparation of young men for railway or hydraulic engineering. . . . The Lawrence Scientific School of Harvard University has already arranged for the services of an instructor in this department, who will devote all his teaching to matters connected with road-construction. . . . If a dozen of our engineering schools in different parts of the country will provide similar systematic and continuous instruction, we may hope, in the course of four or five years, to graduate trained road-masters who are well informed in the science and art of their profession."

Notes.

The Prussian Academy of Sciences recently voted a grant of 2,000 marks to Professor P. Ascherson, to enable him to issue a new edition of Koch's *Synopsis floræ Germaniæ*.

It is reported from St. Petersburg that the beautiful gardens on the island of Fontanka, in the river Neva, were totally destroyed during a terrible storm which occurred on the night of September 23d, when the stream rose to a height of six feet above its normal level.

Among the special prizes at the Chrysanthemum Show, to be held next week in Madison Square Garden, New York, is the GARDEN AND FOREST Cup, valued at fifty dollars, and offered by the publishers of this paper for the best vase of cut Chrysanthemums containing six blooms of any one variety.

Of hybrid perpetual Roses, Mrs. John Laing was exhibited oftener this year at English exhibitions than any other variety, and it is only excelled by Madame Gabriel Luizet and La France in the number of times it has been staged during the last three years. Among the Tea and Noisette Roses, The Bride, which is a nearly white sport from Catharine Mermet and of American origin, was shown the oftenest—that is, forty-five times.

In the famous old gardens of Syon House the Lebanon Cedars are noted for the cleanness, the length and size of their trunks rather than for the great sweep of boughs. Trees with branches which spread 100 feet are not uncommon, however, nor are trunks rare which are fifteen feet in circumference. There are many striking specimens of *Taxodium distichum* in this garden over 100 feet in height and throwing up knees two or three feet high over a circuit 100 feet across on the turf.

Apart from its beautiful flowers, graceful form, the delicate texture of its bark and ample foliage during the summer, the Virgilia, or Yellow-wood (*Cladrastus lutea*), deserves to be noticed as taking rank among the most beautiful of our native trees for its autumn coloring. While the majority of trees whose dead leaves do not cling to the branches all the winter are entirely stripped, the Yellow-wood is still well clothed with foliage of a clear yellow which is especially bright when the sun shines on it.

On account of the graceful way in which its snowballs are tossed in the air, the old-fashioned *Viburnum opulus* is superior to the newer Japanese species *V. plicatum*. The foliage of the latter, however, is not nearly so liable to be crumpled up by insects, and it has the additional advantage that its foliage turns in autumn to a deep and rich color, which is altogether indescribable in words, but which has been called a crimson-bronze. The leaves, too, cling to the shrub very late, so that this rich coloring appears at a time when it is highly appreciated.

In the diary of the late Professor J. W. Bailey, some extracts from which were recently published in the *Bulletin of the Torrey Botanical Club*, it is related, on the authority of Dr. Torrey, that Professor Lindley's well-known *Outlines of the First Principles of Botany* was wholly written on journeys to and from his residence, about six miles from London. "When the stage stopped at an inn Lindley would write on a scrap of paper a sentence or two of the work, using his hat as a desk, and this was but one instance of the constant devotion and industry of the Professor."

The *Gardeners' Chronicle* quotes from one of the essays of Mr. William Paul, which have been lately collected into a volume, the following sentence: "It would be commercially unwise to attempt to raise Hyacinths against such skillful gardeners as the Dutch. We can buy and sell cheaper than we produce." To this the *Chronicle* adds the comment that, while it is true as a general statement, experience at Kew for two or three years tends in the opposite direction, and, indeed, it is a fact that bulbs have been cultivated successfully in the

sand-hills of Sandwich. We may add, that experiments in this country show that more than one of the so-called Dutch bulbs can be grown with profit here.

Mr. Thomas Calhoun, of Wilson County, Tennessee, was one of a committee appointed in 1847 to select the grounds for a camp-meeting and the site for the audience-shed. He carried with him a Sycamore handspike, which he drove into the earth at the spot chosen for the pulpit. The shed was soon erected but the stake was not disturbed, and in time it put out shoots and leaves. Mr. Calhoun was about forty-five years old when he drove in the stake, and he is living yet to see it after it has developed into a tall Sycamore, twenty-two inches in diameter and as straight as a stove-pipe.

It is an unusual season when Cannas are blooming out-of-doors in the last days of October, and therefore it is not fair to expect that the earlier kinds of hardy Chrysanthemums will always do as well out-of-doors as they are doing now. At the same time there are few years when we have not many bright warm days in October, so that if hardy Chrysanthemums are covered up for a few bitter nights we may generally expect that they will give good bloom until November. Of course, exhibition blooms can never be grown out-of-doors, but with a proper selection of varieties we can have sheltered spots in our out-of-door gardens gay with the crimson and yellow and white of the hardy Pompons and Chinese varieties.

During the second week of October there could be seen in this city near the Worth Monument, on the Broadway side of the triangle which is encircled by Horse-chestnut trees, one specimen which had done its best to decorate in honor of Columbus. Like most of our city Horse-chestnuts, it had long been almost leafless, clothed only by a few gray and shrunken shreds of foliage. But before the other festivities began it threw out from the ends of several of its branches tufts of fresh bright light green leaves, and even some panicles of blossoms which, while not so large and full as those of its spring-time, had a very odd effect against the background of the sparse withered leaves. The fresh leaves and flowers together looked as if they had been tied to the trees instead of growing there in defiance of the seasons.

One of the most attractive objects in Ventura, California, according to the *The Unit*, which is published in that town, is a hedge of Heliotrope two hundred feet long, facing the street, and in the gardens of Mrs. Theodosia B. Shepherd. The walk is three feet below the garden-level, and on the banks above, wires stretched upon low posts support the plants, which now droop down to the walk and stand six feet above it covered with fragrant masses of flowers. The plants were set out five years ago, and all the year their beauty and perfume attract not only the birds and bees, but children passing by fill both hands, and gentlemen and ladies catch a spray for a boutonniere or a corsage-bouquet, for Mrs. Shepherd says the Heliotropes belong to the town. In the last week of September the branches were trimmed and the seed gathered. Three men were kept busy for two days cutting, raking, sweeping and sifting. The trimmings were carried away by the wagon-load, and twenty-five pounds of good, firm seed harvested, and yet, in a fortnight, the hedge will be prettier than ever. It requires trimming three or four times a year.

In speaking of plants which are in danger of extermination, M. V. Brandicourte, Librarian of the Linnæan Society of the North of France, writes in the *Journal of Horticulture* that one of the most graceful species of Eucalyptus, *E. Alpina*, formerly abundant in Mount William, in Australia, would now be unknown had not Baron von Mueller planted the specimen in the Botanical Garden at Melbourne. *Psiadia rotundifolia*, a tree belonging to the Compositæ, some twenty feet high, with heavy naked branches and small Aster-like flowers, was once abundant in St. Helena. Man and goats have played such havoc with the forests of that island that this species would be reduced to a single individual but for the fact that it has been cultivated at Kew. From the Department of Sonne, in France, some fifty species have already disappeared, or are tending to disappear, those most menaced being plants sought by amateurs or horticulturists on account of their gracefulness or the brightness of their flowers, and those which are taken by botanists, who sack everything that is rare. Foreign botanists have extirpated even the last living representative of the dwarf Palm (*Chamærops humilis*), which formerly grew in the vicinity of Nice, and an interesting Orchid, *Spiranthes Romanzoviana*, with a white and exquisitely fragrant flower, has apparently disappeared from the small meadow on the borders of Bantry Bay, in the south of Ireland, which was its only known station.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLES:— <i>Quercus densiflora</i> . (With figure).....	517
The White Mountain Forests.....	517
Grottoes in France.....	518
Are American Varieties of Fruits Best Adapted to American Conditions?	
<i>Professor L. H. Bailey</i>	518
<i>Mrs. Danske Dandridge</i>	520
Hard Times in West Virginia.....	520
NEW OR LITTLE-KNOWN PLANTS:— <i>Aster surculosus</i> . (With figure).....	520
FOREIGN CORRESPONDENCE:—London Letter.....	<i>W. Watson</i> 520
CULTURAL DEPARTMENT:—Hardy Bulbs.....	<i>C. L. A.</i> 522
The Colchicum.....	<i>M. Barber</i> 523
Cape Oxalis.—III.....	<i>W. E. Endicott</i> 524
Fern Notes.....	<i>W. H. Taplin</i> 524
<i>Magnolia Soulangeana</i> , <i>Cestrum aurantiacum</i> , <i>Phyggeius Capensis</i> , <i>M. Barber</i>	525
Hardy Ever-blooming Roses.....	<i>Joseph Meekau</i> 525
CORRESPONDENCE:—Rambling Notes from the Ozarks.....	<i>Lora S. La Mance</i> 525
The Sierra Nevada Forests.....	<i>Mark B. Kerr</i> 526
Fungus Troubles in the Orchard.....	<i>Professor L. H. Bailey</i> 526
A Good Hybrid Anthurium.....	<i>R. M. G.</i> 526
<i>Chrysanthemums</i> at Short Hills, New Jersey.....	<i>X.</i> 526
PERIODICAL LITERATURE.....	527
NOTES.....	527
ILLUSTRATIONS:— <i>Aster surculosus</i> , Fig. 88.....	521
The Tan Bark Oak, <i>Quercus densiflora</i> , Fig. 89.....	523

Quercus densiflora.

THE Tan Bark Oak, as *Quercus densiflora* is usually called in California, is morphologically the most remarkable of all the North American Oaks, and in some respects is almost as much of a Chestnut as it is of an Oak, although its fruit is a true acorn. The inflorescence resembles that of the Chestnut, and consists of a cluster of long, erect aments, pistillate at the base and staminate above, or entirely staminate, and particularly conspicuous from the slender filaments many times longer than the minute anthers. From those of the Chestnut, however, the female flowers differ in being solitary, and not clustered in the involucre which develops into the cup of the acorn. This tree is particularly interesting, therefore, as showing the near relationship between the Oak and the Chestnut, while to the student of plant-archæology and of the laws which govern the distribution of forms of plant-life over the surface of the earth, it is of special interest. No other tree in America or Europe resembles it, but in eastern and southern Asia there is a whole group of Oaks so similar in the structure of their flowers to this solitary inhabitant of the New World that it is possible to suppose that the Californian and the Asiatic trees possessed, not very long ago, a common ancestor from which the two lines, slightly differentiated in structure and now widely separated geographically, have come down. The relationship is all the more remarkable, because it is in the flora of eastern America, and not in that of the western part of this continent, that we are accustomed to find eastern Asiatic types, and the peculiar trees of our Pacific forests have few prototypes on the opposite shores of that ocean.

The Tan Bark Oak is one of the handsomest and most useful Oaks of North America. Large specimens, which are sometimes a hundred feet tall, develop a broadly conic to oblong head of unusual regularity and beauty. Under the shadow or on the borders of the forests of Redwood, the favorite situation of this tree, it is forced upward in

search of light, and then forms a more or less spire-like top, but in open situations where light and space abound, the branches spread out horizontally and form the broad head which makes some individuals of this tree as handsome and symmetrical almost as it is possible for any Oak-tree to become. The leaves are persistent through the year, large, leathery, and lustrous, in shape and size not inferior to those of a vigorous Chestnut-tree, but much thicker, and while young covered on the lower surface with pale tomentum which, in disappearing, leaves them pale and smooth. Like all California Oaks, individuals of *Quercus densiflora* differ remarkably when subjected to different conditions of climate and soil. Sometimes they are tall and stately trees, and sometimes little bushes with slender stems only a few feet high. Sometimes the leaves are six or seven inches long, sharply and boldly toothed, and very thick; on other individuals they are thin, entire or nearly so, and barely an inch and a half long. The fruit, however, with its beautiful shallow cups, silky-tomentose on the inner surface and covered with long linear spreading and recurved scales, does not vary except in size, so that when the trees are in flower or are bearing fruit, it is easy to distinguish them in spite of the uncertain characters afforded by the foliage.

The wood of the Tan Bark Oak is hard and heavy; it is too porous, however, for casks, and, like that of all the California Oaks, is too brittle to be of much use for the purposes for which Oak-timber is mostly esteemed, although it makes good fuel. The great value of the tree is in the character of its bark; this is extremely rich in tannin, and leather made from the wood is of excellent quality. The bark of no other tree of the Pacific coast is so esteemed by tanners, and for years its systematic destruction has been going on in all the region it inhabits. This, fortunately, is of considerable extent, as the Tan Bark Oak is scattered over the coast-ranges from the valley of the Yumqua River, in Oregon, to the Santa Lucia Mountains, in southern California. Unlike some of our eastern Oaks, however, it never forms a large part of the forest, and although it was by no means a rare tree thirty years ago, it was nowhere very abundant. Like other Oaks, it reproduces itself freely if fire and browsing animals do not destroy the young plants too often, but natural reproduction is not keeping pace with the annual destruction of the old trees, and unless conditions of forest-management in California are radically changed, in the course of a few years the Tan Bark Oak, like several other California trees, must become extremely rare, and California tanners will have to depend on the Hemlock-forests of the far north, or on the bark of Australian Acacia-trees, raised in the south, to supply their vats. This is a state of affairs which they should not contemplate with equanimity, as it will mean that they will not be able to compete advantageously with the product of eastern tanneries.

The illustration on page 523 of this issue displays a fine specimen of *Quercus densiflora*, grown on the borders of the forest, in the neighborhood of the Bay of San Francisco. For the photograph from which it has been made, our thanks are extended to Mrs. T. S. Brandegee, of San Francisco, who kindly furnished it for publication.

The White Mountain Forests.

IN the very first number of the first volume of this journal Francis Parkman made a plea for the preservation of the forests of the White Mountains because of their importance as elements of the scenery which makes that region so attractive to summer tourists, and so profitable, therefore, to the state of New Hampshire. This value is just as real and tangible as is the modifying power of a tree-covered mountain-slope over the agriculture and manufactures and general health of the people who live in the plains below and receive their water from fountains above. It is a value which can be estimated in dollars and cents as truly as can the wood-products which pass into economic

use through the saw-mills. The sweeping away of these forests means irreparable loss to the people of New Hampshire, and the desolation of its scenery will bring more serious impoverishment to the state than the drying up of its water-sources and the extinction of its timber-supply.

Since these woodlands belong to private individuals there is no legal means for arresting the destruction of the mountain forests and the calamities which will surely follow. The only way in which this scenery and the revenue which comes to the state from it can be perpetuated seems to be some reassertion by the state through legislative enactment of its original control over these forests. We are well aware of the obstacles in the way of a proceeding which appears so unusual, although founded on principles which are accepted without question as the basis of many other laws and customs. We do not assume, therefore, to urge upon the people of New Hampshire the adoption of this policy, but we are sincerely gratified to learn that a movement in favor of this exercise of the right of eminent domain has been started in New Hampshire. This makes a definite issue, a specific question to which there is an affirmative and negative side. There is no dispute about the present facts of the case. If there is no check put upon the forest-destruction in that state, the White Mountain region as a summer resort is doomed more certainly than are the manufacturing interests along the Merrimac. It is high time, therefore, that the people of New Hampshire should face the situation, and make up their minds what to do about it.

Mr. J. B. Harrison, the Secretary of the Forest Commission, is in the field, and has agreed to speak anywhere in the state where a meeting can be arranged. All the intelligence of New Hampshire ought to be enlisted in a discussion of such moment. There is no village or school district in the state which would not find it profitable to organize a meeting to consider the responsibility of the people of the state for the forests of the state. Every newspaper should help to kindle popular interest in the subject. Great changes are in progress, and wise men will adjust themselves to coming conditions. If, as it would seem from articles which have recently appeared in New England papers, the hotel-keepers and owners of factories—that is, the men most immediately concerned in this movement—are apathetic, it is time that the public spirit of the whole people should be aroused. Nothing but good can possibly come from a clear presentation of the truth and a dispassionate argument upon the merits of the proposed policy.

Grottoes in France.

AT a reunion of the Fine Arts societies of the various departments of France, held in Paris during the past summer, Monsieur de Montaiglon spoke of those grottoes built with shells and irregular ornamental stones, which were so much in vogue for the ornamentation of gardens from the beginning of the sixteenth to the end of the eighteenth century, and the humble successors of which are found in the rockeries of the modern garden. He cited especially the great grotto of the palace at Fontainebleau, made in the time of François I., those which Palissy erected for the Duc de Montmorenci, and which, if ever finished, were probably transported, the one to the Château d'Ecouen, destroyed in the French Revolution, and the other to Chantilly; the one which was built in the Tuileries gardens, in Paris, and the one at the Château d'Anet, the materials of which must have been very diverse and valuable, as when this place was likewise destroyed during the Revolution, they were preserved and formed the beginning of the national Museum of Natural History.

Furthermore, among historical grottoes, the speaker named one constructed by the Cardinal of Lorraine at the Château de Meudon, which was removed by the son of Louis XIV. to make room for the construction of a new building; those at St. Germain belonging to the palace

built by Henry IV.; the one near the Menagerie at Versailles, and, also at Versailles, the one called the "Baths of Thetis," constructed, it is said, to receive the groups which afterward were used to ornament the "Baths of Apollo"; and those connected with the private apartments of the king, of Mademoiselle de La Vallière and of Madame de Montespan—all made at the same time and each costing the same amount of money. Fouquet had a conspicuous grotto on his famous estate at Vaux, made familiar by the descriptions in Dumas' *Vicomte de Bragelonne*; Charles Lebrun, the painter, had one at his country-house, and so did Charles Perrault, the architect, at Méry-sur-Orge, and this last still exists in excellent preservation.

These are by no means all the grottoes which once were famous in France, but the list is long enough to show how fashionable they were. And their history and remains are of especial interest, because, from the love of this rock and shell work and of the irregularly decorative forms it implies, it eventually affected French taste in general, and brought about a revolution, not only in decorative but also in architectural art. Every one knows the architectural term "Rococo," and the nature of the art it characterizes. But perhaps it is not so generally known that the word comes from *rocaille* (rock-work), and that the form of art it characterizes sprang from the same source. When this fact is known, however, it is easily read in all the work of the age of Louis XV., where unsymmetrical line, and masses, and flowing ornaments of shell-like or sharply pointed, but always irregular shape, mark every kind of manufactured object, from house-fronts, doors, wall-decorations and wrought-iron gates and railings to furniture, table-china and silver, laces, dress-materials, jewelry and every minor article upon which the designer of forms and patterns worked. This is probably the only instance in which a general and radical revolution in taste, affecting art from its highest to its humblest manifestations, originated in a special development of taste as regards the ornamentation of gardens.

Are American Varieties of Fruits Best Adapted to American Conditions?

THE following paper was read by Professor L. H. Bailey before the American Horticultural Society at its meeting last month in Chicago:

Fruit-growers assume that the varieties which have originated in this country are better adapted to our soil, climate and market than those imported from other countries. While the presumption favors this idea, the proposition demands investigation, and, if true, it should be capable of proof. It is obvious that domestic varieties are best adapted to the demands of our markets, because those seedlings which most nearly meet these demands have been selected and propagated. The commercial ideals are definite and easily satisfied, and we need not longer consider them here. But the adaptations to all those various conditions and phenomena which we collectively designate as climate, are obscure, and they have not been carefully studied; and this relationship of American varieties to American climate, so far as it concerns some of the general adaptations of our fruits, is the particular subject of this paper.

We can draw some useful conclusions from a comparison of our native flora with that of Europe, whence most of our foreign fruits are derived. With the exception of some arctic and sub-arctic species, the plants of North America are singularly distinct from the European plants, although much like them. There are few species which are common to both continents. Most of the plants which were once thought to be the same in both continents are now separated by botanists, and I am convinced that this separation should proceed to nearly, if not quite all, the remaining supposed identical species of the temperate latitudes. The more closely we study these species the greater the differences of habit and distribution appear to be. All this proves that, while the European and North American floras had a common origin in circumpolar regions, the present floras of the two continents have diverged, until nearly or quite all the specific types in the central and southern areas are dissimilar. This dissimilarity has been brought about by the action of environments—largely of climate—in the two continents. In other words, the habitual dissimilarity of the floras

proves that the climatic environments are so different that identical species rarely thrive in both. And this fact lends plausibility to the statement that horticultural varieties, which differ from species only in degree and not in kind, must constantly tend to diverge in the two countries.

The dissimilarity of European and American congeneric species is well illustrated in some of our fruits. Thus our cultivated Raspberries, Blackberries, Gooseberries and Grapes are American species, and the profitable cultivation of these kinds of fruits did not begin until we gave up our endeavors to grow the European species. The case of the Red Raspberries is particularly instructive because the European and American species are so much alike that botanists have never been satisfied that they are distinct; but all berry-growers know that the European varieties will not succeed as market berries in this country. This superiority of the American small fruits and grapes is not due to any greater excellence in quality or appearance in these fruits; on the contrary, they are commonly inferior in these points, for they have not yet had a long enough history to bring them to a high degree of perfection. Their success is due to their perfect adaptation to their surroundings, as an ability to withstand our climate or the attacks of insects and fungi. The capability to withstand or repel attacks is well shown in the Grapes, which resist downy mildew and phylloxera better than the European varieties, and in the American Gooseberry, which does not suffer seriously from the mildew. The European Plums are also subject to difficulties which the native species, now coming into prominent cultivation, more or less avoid. What is true of a comparison of the European and eastern American floras appears to be true, in varying degrees, of comparisons of other floras with our own, all of which shows that the horticulture of eastern and central North America must constantly tend to differentiate itself from that of all other countries.

If these general conclusions are well founded, we should even now be able to find some corroboration of them in a study of our varieties of fruits, for the literature of our horticulture covers three-fourths of a century, and evolution aided by cultivation is much more rapid than under wholly natural conditions. Among the fruits which have been brought from Europe the Apple has been longest cultivated in this country, and it thrives over the widest range, and we should be able to draw some valuable lessons from its behavior. The first American work on pomology was William Coxe's, published in 1817. In this work is given a list of "one hundred kinds of the most estimable Apples cultivated in our country." The list contains one hundred and one kinds, of which only about a half-dozen are now popular, and only one, the Rhode Island Greening, can be classed as a general market fruit. The geographical origins of eighty-nine of these varieties are determinable, of which number thirty-two, or thirty-six per cent., are of European origin, and fifty-seven, or sixty-four per cent., are American. The first edition of Downing, 1845, describes one hundred and ninety varieties of Apples, one hundred and eighty of which have known origins. Of these one hundred and eighty kinds, eighty-seven, or about forty-eight per cent., are European, and ninety-three, or fifty-two per cent., are American. Between 1817 and 1845, therefore, there was apparently a gain in the introduction of European Apples over the American; but this need excite no surprise when we consider that those were the pioneer and formative days of American pomology, when great discrimination in varieties was not practiced, and when Europe was the most prolific source of new varieties.

In the second edition of Downing, 1872, we find a decided change. There are descriptions of 1,823 varieties of Apples, and the origins are fairly well determined of 1,326 of them. Of this number 464, or 35 per cent., are European, and 862, or 65 per cent., are American; and these figures undoubtedly give undue advantage to the European Apples, because of the 497 varieties unaccounted for, I should judge that fully three-fourths are American. In the twenty-seven years between the first and second editions of Downing, therefore, there was a remarkable falling off in percentage of Apples of European origin and a corresponding increase in American varieties. It would not be safe to say, however, that all of this loss in European varieties is due to lack of adaptation of these varieties to our climate and other environments. Fashion or the desire to patronize domestic productions may have influenced this result, yet it is not probable that either of these causes could have defeated a profitable variety. But there is another and more important aspect of the question, and that is the fact that probably over three-fourths of the prominent Apples belong to the American part, which comprises 65 per cent. of the list; and of the popular market Apples a still greater per-

centage is to be found among the Americans. In this connection we may study with profit the Michigan Fruit Catalogue (1888), prepared by T. T. Lyon, which rates all prominent varieties for Michigan in three categories—dessert, culinary and market—upon a scale of ten. This catalogue contains 219 varieties of Apples. Of these thirty-eight are rated nine and ten for dessert, of which two are known to be of European origin and three more are supposed to have come from that country—that is, somewhat over an eighth of the dessert apples of Michigan are of probable European origin, the remainder being domestic varieties. Mr. Lyon admits nineteen varieties to the rank of nine and ten for market, of which two—Duchess of Oldenburgh and Red Astrakhan—are Russian, and another is perhaps of European origin. Less than one-sixth of the Michigan market apples, therefore, are of Old World origin, and one of these—the Duchess—is of recent introduction as a market apple. Of the nine Crab-apples admitted by Mr. Lyon, all but the comparatively unimportant Red Siberian are of American origin.

The Pear affords an interesting study in this connection, for it is a fruit which has been highly cultivated and developed in Europe, but has received only indifferent attention in this country, so far as the production of varieties is concerned. Coxe, in 1817, described sixty-five Pears as grown in this country, of which only four, or less than one-sixteenth, were American in origin. Of the whole list, only the Madelaine is popular now. In 1845 Downing described 239 kinds, 192 of which, or 80 per cent., were European, the remainder being American. In 1872 the Downings admitted 995 varieties, of which 954 have a known geographical origin. Of these, 708 varieties, or seventy-four per cent., are foreign. There has, therefore, been a gradual increase in the percentages of domestic varieties from the beginning, although the foreign kinds are still predominant. In Mr. Lyon's Fruit Catalogue twenty-one Pears are admitted as nine and ten for dessert, of which seven, or just one-third, are American; and exactly the same ratio holds in the twelve varieties standing nine and ten for market. All these facts are indications that even in Pears the American varieties are prominent and are increasing in number, and they suggest the possibility that European varieties may eventually practically disappear from our horticulture.

What is true of Apples and Pears appears to be true also of other fruits. Of the seventy Peaches which Mr. Lyon catalogues, only five are foreign among those rating nine and ten for dessert and market, and of this number only one—the Rivers—is prominent. Next to the Pear, the common Plum is the most peculiarly European of any fruit of eastern and central United States, yet of the fourteen varieties admitted by Mr. Lyon as nine and ten for dessert, one-half are American, and of the six market sorts, four are American. It is interesting to note, also, that the region of adaptation of the common Plum is not large, and that the varieties of the native species are evidently destined to cover a very wide range of our southern and interior territory.

If any conclusion can be drawn from all the foregoing figures and remarks, it is to the effect that, as a rule, American varieties are best adapted to American conditions, notwithstanding the fact that there are some foreign varieties which thrive over large areas of this country.

The question of the adaptations of the Russian fruits to this country at once arises, and this brings up a still broader question, the adaptability of our own eastern fruits to the great interior basin. On a former occasion* I made an examination of the reasons for the premature failure of Apple-orchards in the prairie states, and I satisfied myself that much of this failure is due to the transplanting of New England and New York varieties to those regions. Every fruit-grower must have been impressed with the fact that the Apples of these prairie states are rapidly assuming a different character from those of the east, and the leading varieties in the two sections are even now distinct. The dissimilarity between these great regions in climatic conditions is also well illustrated in the floras, for there is a marked tendency for the specific types of the east to stop at the borders of the prairies. In other words, we have floras characteristic of the prairies and plains. Even the Wild Crab (*Pyrus coronaria*) of the eastern states does not occur in the prairie regions, so far as I know, being there represented by its congener, *P. ioensis*, a well-marked species. More than all this, we know that it is absolutely impossible to grow our common eastern fruits in the cold north-west. Our interior regions must, therefore, be considered apart from the older states, and when we once understand this fact thoroughly much of the prejudice against Russian fruits must disappear.

* *On the Longevity of Apple-trees.* Kans. Hort. Soc., 1890.

The situation is simply this: the north-west must have an unusually hardy class of fruits, and any type of fruit which will grow there should be encouraged. The Russian is simply one of these types, the Siberian and native Crabs being others. But, inasmuch as the Russian type is the most highly developed of them, it follows that quick results are to be expected from it. If the Russian Apples and the Crabs are more or less adapted to the north-west, I feel sure that American seedlings of them will be still better adapted to those conditions, as a whole, and this must be the opinion of many of the fruit-growers of the north-west, else the talk about promising seedlings of Duchess and other families is meaningless. Already the McMahan, Wolf River, Pewaukee, North-western Greening and others are great blessings to the north-west. I look for the time when the present imported fruits and Crabs will be superseded by their own progeny in the same way that the lists of Coxe and other early writers have been supplanted. Already the tide has set in which shall submerge them. I therefore regard the Russian importations as of immeasurable benefit to our horticulture, but I look upon them as a means rather than as an end. The history of our horticulture everywhere emphasizes the probability of a secondary and more important outcome.

The conclusion of the whole matter, as it now lies in my mind, is this: American fruits constantly tend to diverge from the foreign types, which were their parents, and they are, as a rule, better adapted to our environments than foreign varieties are. In less than a century we have departed widely from the imported varieties which gave us a start. At the expiration of another century we should stand upon a basis which is nearly, if not wholly, American.

Hard Times in West Virginia.

RETURNING to Rose Brake, after an absence of nearly two months, the home-grounds were found parched and browned by the worst drought ever known here. All vegetation was languishing, the foliage of the trees shriveled and scorched, the color of the leaves dull and faded. Even the Virginia Creeper, which in October waves its scarlet drapery from the trunks and tops of the tallest trees, was a sober brownish crimson.

Coming from the hills and mountains about the Delaware Water Gap, where timely showers had kept the grass fresh and luxuriant, and where the trees were already beginning to glow with autumnal color, we found the desolation in the valley of Virginia all the more apparent by contrast. In the home-grounds the evergreens had suffered the most, and many had perished outright. A good watering followed by heavy mulching has, in past summers, tided many nurslings over a parching drought; but this year, with dry cisterns and the absence of the care-taker, such treatment was impracticable. Few deciduous trees or shrubs have succumbed to the heat, but nearly all fall-blooming plants have found it hard enough to hold their own without flowering, and few blossoms cheered the garden-beds. The sunny bloom of the brave Marigolds and *Corchoruses* nodded a welcome to the visitor, but the *Hydrangea*-heads had withered on their stems, and the Japanese *Anemones* were nearly dead.

A few berries ornament the bushes here and there, and the Witch Hazel has put out its yellow fringes amid shriveled leaves. A plant sent to me as *Elæagnus longipes*, and described as a "shrub or small tree that ripens its berries in July," is now covered with fruit, both green and red, and has capriciously waited for frost before commencing to ripen. The berries have a pleasantly acid and slightly mucilaginous taste. We have not yet tried them as a substitute for cranberry-sauce, for which purpose they have been recommended. They are so pretty on the tree, densely scattered along the limbs, and so quaintly marked with fine gray dots over the surface of lucent green or red, that it seems a pity to pick them for any purpose. The birds trouble them very little, perhaps because birds do not care to try food-experiments; but I fear that when they discover their delicious qualities they will leave very few for us. [The plant is not *Elæagnus longipes*.—ED.]

Thunberg's Barberry has turned crimson, and the berries are a brilliant scarlet. Some Thorn-trees are a vivid mass of fruit, and *Cotoneasters* are covered with balls, which look like tiny apples, yellow and red.

In one part of the grove we have planted trees and shrubs with a special view to their fall aspect, and these we are now watching with special interest. Here are *Enkianthus Japonica*, *Parrotia Persica*, and a few other rarities, which are at their

best in October; also a fine young Scarlet Oak, Scarlet and Sugar Maples, Sour Gums, *Kolreuteria*, Liquid Amber, Sumachs, *Virgilia*, and many shrubs. Of this group, only the Sour Gums have been as brilliant as usual.

Our pretty little *Erica carnea*, which is planted in a hollow, is as fresh-looking as it was in May, and has bloomed steadily since the end of June without watering. The same may be said of *Abelia rupestris*, a most beautiful and interesting little evergreen. *Aster oblongifolius*, still covered with buds, has begun to expand its large blue ray-flowers. This is one of the handsomest of Asters, and withstands drought as well as *Portulacas* do; hundreds are blooming, undeterred by frosty nights.

Rose Brake, W. Va.

Danske Dandridge.

New or Little-known Plants.

Aster surculosus.

NEARLY related to *Aster spectabilis*, one of the most beautiful of the low large-flowered Asters of the coast-region of the northern Atlantic states and now sometimes found in the choicest collections of hardy plants, *Aster surculosus* replaces that species at the south, where it is found near the sea, growing in sandy soil from southern New Jersey to Georgia, and also on the Blue Ridge of North and South Carolina, where it abounds, and where it was first noticed a century ago by the French botanist Michaux.

Aster surculosus sends up low stems twelve to eighteen inches tall from long filiform root-stalks; they are covered with rigid, nearly entire leaves, which near the ground are oblong-lanceolate, and are linear above. The flower-heads are large and showy, with puberulous involucre and beautiful bright violet rays.

Our illustration (see page 521), which appears to be the first ever published of this handsome plant, was made by Mr. Faxon from a specimen grown in the Botanic Garden of Harvard College.

Foreign Correspondence.

London Letter.

ASTERS IN ENGLISH GARDENS.—The popularity of the genus *Aster* in England, and especially of that section of it known as Michaelmas Daisies, has had considerable development in recent years. Some difficulty has, however, been experienced by those interested in these plants owing to their names being almost hopelessly mixed, what was known by one name in one place being called by one or several different names elsewhere. The Royal Horticultural Society set itself the task three years ago of remedying this by gathering together for cultivation in their gardens at Chiswick all the shrubby Asters in cultivation. They then appointed experts to study these, and, if possible, reduce their names to order. This has been accomplished, or nearly so. Mr. Dewar, of Kew, was one of the appointed experts, and at a recent meeting of the Society he read a paper on the Asters, in which the views of himself and his co-workers are embodied.

In America you probably know a great deal more about Asters than is known here. At the same time, as a considerable number of improved varieties and supposed hybrids have originated in cultivation here, you will probably be interested in a résumé of Mr. Dewar's paper.

The Chiswick collection of Asters is now the largest and best-known in England. The supposed hybrids and garden-forms are planted side by side with the typical species, supplied from the Kew and Harvard collections. Professor Asa Gray was puzzled by the forms of American Asters grown in England, although, of course, he was thoroughly acquainted with the types. It is supposed that by a process of selection and cultivation extending over a long period in England the characters of some at least of the American wild plants have been more or less modified. The greater number of our Michaelmas Daisies are from species found wild in the eastern United States, few of those found in the west being in cultivation here.

Some of these Michaelmas Daisies are not properly Asters, Erigerons, Boltonias and Calimeris being included among them.

Mr. Dewar says that Asters cross or hybridize as freely

A. longifolius, are evidently most prevalent in the popular garden kinds, although there are something like twenty American species represented here. The named garden varieties are recommended as being much superior to the typical or wild species. A list of the best of the varieties will be published in the journal of the Society.

It is unnecessary to praise the Michaelmas Daisies as autumn-flowering plants. They form the most striking of the flower-pictures in the open air at Kew at this time of year. Massed in the mixed borders or planted alone in beds they are equally effective, and as they are among the easiest to cultivate of all plants, their claim to popularity is of the strongest. Mr. Dewar recommends them as bedding-plants, a purpose for which such kinds as *A. alpinus*, *A. acris*, *A. Amellus* and several others have been in use some years at Kew. Like all other plants, these Asters repay good cultivation. They like a deep, strong, loamy soil, and they should be dug up, divided and replanted every two or three years. Spring-struck cuttings of the young shoots form nice plants in a year. The tall kinds, such as *cordifolius*, *Diana*, *W. J. Grant*, *paniculatus*, *Lindleyanus* and *Arcturus* are suitable for planting to form single specimens on the lawn.

Dr. Masters remarked at the meeting when Mr. Dewar's paper was read that the Michaelmas Daisies, having now "caught on," are certain to improve rapidly in the hands of enthusiasts, as all other garden-plants have when thoroughly taken in hand. At present they are extremely beautiful in the garden, and equally so when arranged in vases. Possibly, however, in a hundred years' time the Michaelmas Daisy will be as far ahead of the present forms as the *Chrysanthemum* of to-day is of the plants from which they have been "evolved" by cultivators.

Besides the American Asters we have also some beautiful species and varieties of European nativity. Of these *A. acris* and its forms are first-rate plants for the border and flower-bed. *A. canus* and *A. Dahuricus* are equally good. Best of all is *A. Amellus*, from central and eastern Europe. There are numerous named forms of this species, the choicest of them being *Bessarabicus*, *amelloides*, *major* and *cassiarabicus*.

From the Himalayas we have the new and beautiful *A. diplostephioides*, which has tufted radical leaves and tall stems, a yard or so high, each bearing a large flower four inches across, colored rich lilac with a yellow disk. *A. Thomsoni* is one of the best of the dwarf autumn-flowering Asters, flowering from July to November. *A. Stracheyi*, also Himalayan, is a creeping species only a few inches in height, with small, but very numerous, blue-purple flowers.

Mr. Dewar also recommends several species from China and Japan, namely,

A. scaber, *A. Tataricus*, *A. trinervis* and *A. Maachii*.

ORCHIDS AT ST. ALBANS.—The month of October is, perhaps, the worst in the whole year for Orchid-flowers, but the best for an inspection of the plants themselves. The



Fig. 88.—*Aster surculosus*.—See page 520.

as the Columbines and Larkspurs do. He also states that "considerably over one-third of the Asters cultivated in our gardens are crosses or seedlings from *Aster lævis* and *A. Novi-Belgii*." These two species, with *A. paniculatus* and

gigantic Orchid business at St. Albans, built up by Mr. F. Sander, deserves a much larger space than you can spare to do it anything like justice; its enormous well-stocked houses, its labor-saving appliances, the comprehensiveness and health of the collections, the excellence of the cultivation, and the general interest of the whole establishment, I must not attempt to deal with at present. I had occasion to visit the St. Albans nurseries this week, and I propose to set down a few of the impressions made as I walked, during the whole of an afternoon, through the many houses in company with Mr. Sander and his clever lieutenant, Mr. Godseff.

Order, neatness, close attention to cultural detail; these are conspicuous features of this nursery. Large houses; but the plants arranged close to the roof-glass, plenty of hot-water pipes, light, a growing atmosphere, fed with plenty of moisture and the exhalations of lime, tan and leaf-mould, these are some of Mr. Sander's secrets. That they answer is evident in the health of the thousands of Cattleyas, the deep green, well-leaved *Ærides* and *Vandas*, *Cœlogyne Dayana* in thousands, with fine pseudo-bulbs and broad leathery leaves, all healthy, and growing with a vigor that suggested leeks. Of course, the grand *Dendrobium Phalænopsis* is there, flowering, too (it is never out of flower, Mr. Sander says), one spike bearing twenty-two large richly colored flowers, all open and fresh. *Cattleya labiata*, with hundreds of flowers and thousands showing; *C. Bowringiana* a broad cascade of flowers. *Dendrobiums* are not every gardener's successes, but at St. Albans they are perfect. There appears to be enough of *Odontoglossum crispum* to plant a ten-acre field, and the plants look as healthy as the healthiest Turnips. What an amount of real pleasure one gets out of looking at plants that are healthy and happy.

Sobralias are very numerous, some new in appearance, with distinctly marked leaves, beside *S. xantholeuca*, *S. leucoxantha*, *S. macrantha* and its variety *Alba*. *Lælia Perrini* filled one end of a house and was in full bloom; a beautiful Orchid, easily grown, for five years at any rate. *Cypripedium Schlimii*, growing in a moist cool corner, was healthier than I had ever seen it before, and flowering freely, too—I don't mean one plant, but perhaps two hundred fine specimens in eight-inch pots. *Cattleya Alexandra* fills, or nearly fills, the whole side of a broad house hundreds of feet long, and *C. Victoria Reginae* is equally abundant. *Barkerias*, *Catasetums*, *Miltonias*, *Calanthes* and *Thunias* are grown in great quantity, grown well and are flowering well, or promise to do so shortly. *Lælia anceps* is here in all its varieties, every variety in great numbers and apparently every plant showing flower. And thus it is in house after house, tropical Orchids of all kinds, intermediate and cool, everything good one might reasonably say, and enough of everything to supply everybody. The breeding-houses are stocked with seedlings in great numbers from *Cattleyas* to—well, I mustn't say what, but there are some promising miracles in those half-dozen houses which Mr. Maynard, who is a second Seden, has under his special charge. I must not omit to mention the many plants in flower of *Cypripedium Chamberlainianum* and *Renanthera matutina*, a most elegant orange-flowered tropical Orchid.

St. Albans is a great Orchid emporium. It is also great in other plants, or soon will be. Mr. Sander now devoting several houses to "new and rare" plants, other than Orchids. I was allowed to inspect the hidden treasures, and I saw there a considerable number of beautiful plants which are certain to find general favor when they are sent out.

We are often told that the nurseryman is only interested in plants as a means of making money, but what an enormous amount of valuable work he does for horticulture while filling his purse with guineas will be evident to any one who cares to study the history of garden-plants and gardening. The nurserymen introduce all the good things nowadays. Here, for example, is a quartette now abundantly represented and flowering beautifully, which we owe

to such business enterprise, *Vanda Sanderiana*, *Dendrobium Phalænopsis*, *Cattleya labiata*, *Cypripedium Chamberlainianum*.

London.

W. Watson.

Cultural Department.

Hardy Bulbs.

WHAT are generally considered hardy bulbs are, in reality, only so in name, and in the sense that they will live through the winter, even though frozen. In fact, but few bulbs produce their flowers as well after being frozen. Hyacinths are classed with the hardy bulbs, but in Holland, where they are grown to supply the markets of the world, they are protected with the greatest care. The beds there are thatched with reeds, which grow in abundance on the banks of the canals, as carefully and as warmly as the roof under which the family sleeps.

Nearly all the *Narcissus* are as carefully protected, and for the same reason. The *Crocus* belongs in the same list. Tulips are more hardy, but are greatly benefited by a slight covering of leaves, manure, or anything that will accomplish the purpose. It is the general opinion of those authorized to speak for the Lily that it is perfectly hardy. This opinion, supposed correct, not having been disputed, finds its way into seeds-men's catalogues, and is prominent in the "cultural instructions," where it does an immense amount of harm. It is founded on the fact that the species denominated hardy are natives of cold or temperate climates. While it is true that some of the species are found in the coldest parts of the habitable globe growing most luxuriantly, it is equally true that these same species are not hardy in our climate to a degree which renders it safe to plant them in our borders without protection. It is but proper to note that there is no climate more severe than ours on all bulbs that are considered hardy and left in the open border during winter. This is particularly applicable to the coast from Massachusetts to Virginia, where the thermometer often indicates forty degrees of frost while there is not a particle of snow on the ground to protect the bulbs. Here the frost penetrates the earth to a great depth one week, and is entirely out the next. These constant changes from freezing to thawing cause the earth to contract and expand to such a degree as to frequently tear the bulbs in pieces. We have had thousands destroyed in this manner.

But let us be more specific. Take the beautiful little *Lilium tenuifolium*, a native of Siberia, where it is largely grown as an article of food. In its native soil it is perfectly hardy, here it is not. Why? Simply because in its Siberian home the first indication of winter is a snow-storm that covers the ground so deeply that frost rarely, if ever, penetrates it at all, while here the earth is frozen to a depth entirely unknown there, notwithstanding their climate is much the colder of the two. The same is true of the *Lilium Martagon*, the bulbs of which are eaten by the Cossacks; in Russia it is perfectly hardy; with us, in the much milder climate, it will rarely survive more than a single season unless protected, and with that precaution it grows with more vigor here than in its native home.

In our eastern states, particularly in New Hampshire and Vermont, where the ground is nearly always covered with snow during the winter season, all kinds of Lilies grow to the greatest perfection. We have seen finer bulbs of *L. auratum*, *L. Brownii*, *L. Chalcedonicum*, *L. Martagon*, as well as other species, grown in these states without the least artificial protection than we have ever known produced elsewhere. There the bulbs named are always healthy and increase as rapidly as any of our native species, merely because their winters are always attended with sufficient snow to protect all vegetation against injury from freezing.

Nature is very considerate in this matter. Wherever the climate is the coldest there will be found the greatest protection given the vegetation. In our own woods there are many delicate little plants that are protected by their annual covering of leaves and snow, that we cannot grow in our borders without the most careful protection, and many of our native forest-trees struggle for an existence and finally succumb to winter's wind and cold when planted in the open.

The question may be asked, and it is a pertinent one, "Do not our native Lilies have the same elements to contend against as those not indigenous to our soil, and, having them, escape uninjured?" Certainly, yes; but nature always protects her own, and in collecting our native species we see how wisely and beautifully it is done. The *Lilium superbum* is rarely found excepting in moist woods or marshy grounds,

where the low-growing trees or shrubs form a network above and beneath the bulbs, affording ample protection against the action of the frost, should it penetrate the heavy mulching of leaves that nature has provided for their protection. *L. Canadense*, or common Meadow Lily, forms its bulbs very deep, usually beyond the reach of frost, as it has for a covering a very heavy turf, than which there can be no better protection. In our own nursery rows we find this Lily by no means hardy.

Whatever may be the cause of failure in the flowering of Lilies and Dutch bulbs of all denominations when planted in our borders, we are fully convinced, from our own observation and experiments, that when they are protected so that frost cannot reach them they will invariably succeed, and thrive in proportion as the other conditions of growth are more or less favorable; while those left unprotected, if in exposed situations, are quite as sure to fail.

The protection of a bed of bulbs is a simple and inexpensive operation. The best, because the most natural mulching, is a covering, say six inches in depth, of newly fallen leaves; these kept in their places by a few boughs or pieces of board, or by throwing a little soil over them. Coarse manure is a

the autumn-flowering group they are beautifully tessellated. *C. luteum*, however, is quite distinct from all other species. It is one of the spring-flowering kinds, a native of the Himalayas, with small bright yellow flowers. The plant would probably prove too tender for this locality, though it is said to be found at a considerable altitude in its native country. Like many of the other species, it is next to useless for ordinary decorative purposes, and its cultivation may wisely be confined to botanical institutions. The distinct color of the flowers may be of service to cross with one of the large-flowered kinds for a distinct hybrid; owing to the widely different character of the plants and their habitats the likelihood of success in such an experiment is decidedly problematical.

In general appearance the Colchicums bear a strong resemblance to the Crocuses, for which, indeed, they are often mistaken. The stamens, however, afford a ready means of identification between the two, there being six in the former, while the Crocus has but three. The underground stems are cormous (rhizomatous in *C. procurrans*), varying in size from that of a marble to that of a man's fist. The leaves also differ considerably in dimensions, being small and inconspicuous in



Fig. 89.—The Tan Bark Oak, *Quercus densiflora*.—See page 517.

splendid mulch, because it affords the protection required, and enriches the soil near the surface, where the feeding roots of the bulbs are to be found. Salt or marsh-hay is also an excellent protection, and not unsightly. In short, whatever material is most convenient and will accomplish the purpose is the one to be used.—*C. L. A., in the Florists' Exchange.*

The Colchicums.

THERE are about thirty species of *Colchicum*, mostly natives of southern Europe and Asia Minor. They may, for convenience, be divided into the vernal class, with flowers that appear in spring, together with the leaves, and the autumnal class, whose flowers are not developed until late in autumn, when the plants are destitute of foliage. The leaves of this last section are put forth in spring, but fade away in summer, not to appear again before the spring following.

The flowers are generally purple or white, running into many more or less distinct shades, and in some members of

some species, while in others they measure from twelve to eighteen inches long and three to six inches wide.

The autumn-flowering group contains the most generally useful species, and a few roots of the best of these should be given a place in every garden. Their flowers show up brilliantly when the glory of the summer garden is fast departing in September and October, and the plants are quite hardy, or require at most only a covering of withered leaves to preserve them from the severest frosts. The flowers without the leaves, it is true, present a rather forlorn appearance, but established masses of the plants afford so solid an array of bloom that foliage seems unnecessary, especially as there is an abundance of luxuriant foliage in most gardens at this season. The rich brown earth makes not a bad setting for their pleasing colors, and, as the autumn moves steadily onward, there is something of a fantastic charm about their mushroom-like appearance. They start like colored rockets from the ground, and shed a light which both illuminates and cheers their entire surroundings.

Colchicum autumnale, the Meadow Saffron of European

countries, takes a prominent place among the species. It was at one time a familiar autumn feature of the fields in the western and southern portions of England, where it was cultivated to some extent for the roots, said to yield a medicine of material efficacy in gout troubles, notwithstanding the fact that it is known to contain, in common with nearly all the other species, properties of a highly poisonous character. The plant retained a hold on those parts of England long after its systematic cultivation was discontinued, but at this time it is practically extinct there, a result of persistent collection by druggists and nurserymen.

The leaves of *Colchicum autumnale* are strap-shaped, deep green, and from nine to twelve inches long. The flowers are of a pale purple color, with narrow tube from four to six inches high, and limb from two to three inches wide, appearing about the middle of September, and lasting from a month to six weeks. There are many varieties of this species, the best of which, with the colors of their flowers, are *Album*, pure white; *Roseum*, reddish purple; *Atropurpureum*, deep purple; *Striatum*, purple and white; *Album Plenum*, double white; *Purpureum Plenum*, double purple. The double varieties are the more desirable, as the flowers last much longer. *C. Byzantinum* resembles *C. autumnale* somewhat closely, but it is a more profuse bloomer; the flowers are a pale rosy purple shade, and the leaves are much broader. This plant inhabits the Levant.

The best species of the genus is *Colchicum speciosum*, a native of the Caucasus. The leaves are of a bright green color, about a foot in length, and from three to four inches wide. The flowers are from nine to twelve inches high; limb cup-shaped, from three to four inches in diameter, and of a rich reddish purple color. *C. Sibthorpii*, a species only recently introduced from the Grecian mountains, is said to be a close rival of *C. speciosum* in the size of the flowers, which are of a deep lilac tint and obscurely tessellated.

Colchicum variegatum, common to the Levant and Asia Minor, is remarkable for the exquisite tessellation of its flowers, the colors being rich purple on a lilac ground; its variety *Parkinsoni*, which is sometimes accorded specific rank, has similar markings of a deeper purple shade on a pure white ground. The leaves have wavy margins, but in other respects these two plants and *C. autumnale* are much alike.

Colchicums do best in a light rich soil and an open position. The corms should be planted, according to size, from three to six inches beneath the surface of the soil, and, as the plants are most effective in large masses, they should be arranged in that way. This should be done as early in summer as practicable—that is, as soon as the roots can be had. The plants are easily increased by separating the corms, and they may also be propagated from seeds, though the latter is a slow process, as seedlings rarely reach the flowering stage before they are three or four years old. The seeds ripen freely, but they must not be sown until the early part of the summer succeeding the flowering season. They remain underneath the ground during the winter months, and are developed with the new growth in spring, rising beyond the surface to be ripened by the summer's sun. They should be sown in a cold frame when perfectly ripe, covering lightly with sandy soil.

Cambridge, Mass.

M. Barker.

Cape Oxalis.—III.

ANOTHER group of these plants consists of species whose flowers are large and showy, and produced single, and whose foliage consists of leaflets borne in twos or threes at the ends of the leaf-stalks; there is often, also, a foliaceous expansion on the sides of the stalks. These forms are so much alike that it is probable that they are not all valid species, yet as garden-plants they are enough unlike to merit distinctive names. They are all of easy culture, requiring no special soil or treatment. If potted at the beginning of September they will flower well in October and November. If they are kept dry until the middle of the latter month and are then planted in a cold frame and kept dark and cool through the winter they will appear above ground in April, and will generally blossom well, though some kinds will do better than others. They will survive with covering, as will all other *Oxalis*, without the protection of glass, but the wetness they then have to endure usually prevents the production of flowers.

Oxalis crispata has unusually large and broad leaflets growing in pairs, and the flowers are white, very faintly tinged with pink, much nearer a pure white than *Jacquin's* figure would lead us to suppose. *O. asinina* and *O. leporina* are named from the resemblance their long, narrow leaflets bear to the

ears of an ass and of a hare respectively; the resemblance, however, is not very close.

The flowers of the first are yellow, of a rather deep shade; those of *O. leporina* are white. *O. fabæfolia* is very ornamental from the great size and bright color of the leaflets, which grow in threes, and the large size and brightness of the yellow flowers. *O. lancæfolia* is a two-leafleted variety with yellow flowers not more than an inch in diameter. The number of leaflets given with each of these species is the usual number, which is not invariable by any means, for often the same plant will have leaves of both two and three leaflets. There are many other species, or reputed species, of this group, some of which I have, but they are so much like some I have described that I am not sure that they are correctly named, and therefore it will be better to say nothing more of them at present. Several species, with from five to seven leaflets and without leaf-like wings on the sides of the stalks, form another group of very distinct appearance. Their flowers are all yellow, of various sizes and shades, all striped outwardly with red, yet all sufficiently unlike to be worth growing. *O. lupinifolia* has from six to ten leaflets, that is six, eight or ten; the number is, I think, always even, and there is a dark blotch at the base of each; *O. flava* has five, seven or nine slender leaflets, so slender that several bulbs should be grown together to prevent a bare appearance. The seven or nine leaflets of *O. flabellifolia* are long and strap-shaped, quite unlike those of any other species. In *O. pectinata* the five or seven leaflets are somewhat fleshy and folded lengthwise, so that the opposite sides stand about ninety degrees apart. There are several species closely resembling this group from Mexico, Brazil and Chili, but no others, as far as I know, belonging to the Cape.

Canton, Mass.

W. E. Endicott.

Fern Notes.

THE work in a Fern-house at this time of the year is largely of a routine character, but, nevertheless, it is far from being uninteresting, for there are constant attractions in watching the development of the fronds or surprises in the production and growth of seedlings. One very necessary precaution at this season is that of watering early in the day, so that the fronds may dry off again, for while a moist atmosphere is required at all times, yet a surplus of moisture on the foliage of the more delicate species will disfigure them. Another point of much importance is ventilation. Comparatively few Ferns relish a close atmosphere, with the possible exception of the Filmy Ferns, and it is, therefore, advisable to keep some of the ventilators open during the night as well as the day just as long as the weather will allow such practice. At the same time cold draughts must be guarded against.

But little potting is needed just now, except in the case of some small plants that will not carry through the winter in their present pots, for most of the larger plants will be nearly through with their active growth, especially those which are partially, or entirely, deciduous, and to this class a late potting is rather injurious than helpful.

A corner devoted to some seedlings of the more common sorts, such as those in general use among the florists, will prove very useful in helping to supply a mantel or table decoration when such may be needed. The plants for this purpose are most convenient when grown in three-inch pots, and for the same purpose a sufficient quantity of *Selaginellas* of such kinds as *S. Kraussiana*, with its variety *Aurea*, *S. Martensii* and *S. densa* may be readily grown under the benches in the Fern-house. Space can be thus economized, and what is frequently an unsightly portion of a greenhouse is covered and made presentable.

If space will permit, some of the smaller Tree-ferns should be planted out in the centre of the Fern-house, even if it be only a small stem or two of *Dicksonia antarctica*, as exemplars of this noblest class of Ferns. A pretty effect may also be secured by clothing the stem of a Tree-fern with a covering of one of the creeping species, such as *Oleandra nodosa* or some of the dwarf *Davallias*. Sections of an old Fern-trunk also make excellent material on which to grow the *Platycterium*, as they offer a congenial medium for the roots of the Stag-horn species, and have besides good lasting qualities.

Where exhibition Ferns are grown some staking is necessary, but it is well to remember that only enough stakes should be used to display the natural beauties of the plant, formal tying being an abomination when applied to a Fern. For this purpose steel wires are very neat, and are less noticeable when painted dark brown or black; in fact, I have used the ribs of an old umbrella more than once in staking a large *Adiantum*, and found them very satisfactory.

Thrips are to be found at any season of the year, and will spread much more rapidly on Ferns that are kept in too warm a temperature. The best remedy for them is tobacco-water, into which the foliage affected should be dipped. The decoloration should not be too strong if there are young fronds on the plant under treatment. Even weak tobacco-water is very distasteful to these insects, and, when used with reasonable care, there is little fear of injuring the foliage, except on such tender species as some of the *Cheilanthes* and *Gymnogrammes*.

To dispose of slugs the camphor method is best, as this gum can be spread among the plants in small pieces, or thrown into the centre of the crown of a plant without any likelihood of injury. It proves to be the most satisfactory remedy I have tested as yet. A special instance of the value of this treatment was brought to my notice last winter in a cut-flower establishment, where a Carnation-house had become badly infested with snails. The grower dosed a space of fifty feet in length with camphor, and, as a result, secured several thousand flowers from the plants in this area, while the remainder of the house was a total loss, owing to the work of the snails.

Holmesburg, Pa.

W. H. Taplin.

Magnolia Soulangeana.—It is, perhaps, noteworthy that this, one of our earliest and best Magnolias, is now ripening an abundance of fruit, and the large scarlet seeds are very conspicuous as they burst their covering. The plants also bear a fine crop of flower-buds, promising a rich floral treat next spring. This is undoubtedly the best early-flowering Magnolia we have, though its appearance lacks finish in the total absence of foliage at the time of flowering. The plant is of neat and compact habit, and the large, purple-tinted, white flowers are sweetly fragrant. The flowering season extends from February to May, inclusive, and it is early or late as the weather is mild or inclement. *M. Soulangeana* is of hybrid origin, having been raised in France by Monsieur Soulange-Bodin from a seed obtained by fertilizing the Chinese *M. conspicua* (the Yulan) with the pollen of *M. obovata*, a native of Japan. It is an improvement upon both parents, and perfectly hardy and reliable in our climate. A few successive warm days in early spring will sometimes induce the flowers to expand, and then they are easily injured on the return of frost, as was the case last season. A piece of light canvas or sheeting thrown over the trees in such an emergency will go a long way in protecting the flowers against serious injury.

Cestrum aurantiacum.—The bright orange-yellow blossoms of this species are very striking and attractive in the greenhouse at the present time. The plants were plunged in the open garden early in summer, where they flowered profusely during the first part of the season. They then made free growth, and were taken up and placed under cover a few weeks ago. *C. aurantiacum* is a native of Guatemala, and has been in cultivation since 1844, when it was introduced by Mr. Skinner, an English gentleman. It is of erect habit, and the alternate leaves are oval, pointed, of rich green color, margins wavy, and, with two-inch petiole, about eight inches long. The sessile flowers are tubular, with five reflexed segments at the apex, where they measure almost half an inch across. Their length slightly exceeds one inch, and they are produced in panicles. This plant is easily cultivated, and does well in any soil in which rich loam predominates. In winter it requires only sufficient heat to exclude frost, but established plants like all the light and sunshine they can get. Propagation may be effected by means of cuttings, which should be kept close and shaded until rooted.

Phygelius Capensis.—This is one of our most charming perennials, and one that will be popular when it is better known. It is treated in this country as an herbaceous plant, but is in reality a dwarf shrub of compact, bushy habit, and about three feet high. The reddish stems and branches are densely furnished with opposite, light green, ovate leaves, the edges of which are serrate. The leaves diminish in size from the base of the stem upward; the blade of the largest measures about four inches, and the petiole two inches in length. The drooping flowers are curved and tubular, an inch and a half long, mouth of five-pointed, spreading segments three-fourths of an inch in diameter, bright red on the outside, and orange-yellow within. They are borne very profusely at the extremity of the shoots in large, erect, tapering panicles, which often exceed twelve inches in length by nine inches through at the base, and the plant blooms continuously from early summer until cut down by severe frosts late in the autumn. *P. Capensis* is a native of Kaffirland, South Africa, where it grows by the sides of streams in the mountainous regions. It was introduced in 1855, by the

Messrs. James Veitch & Sons, of London, England. It is a good border-plant, thriving well in any good garden-soil, and if a thick covering of leaves is applied before the winter sets in the lower parts of the branches, with the roots, will remain uninjured by frost, sending up in spring shoots more vigorous than those of the preceding season. In the warmer sections of the country, with a little encouragement in the form of richer soil and frequent supplies of water in dry weather, it will doubtless grow freely and flower abundantly during the greater part of the year. Cuttings of the young wood root quickly in summer if they are inserted in pots containing sandy soil, placed in a frame under glass and kept close, moist and shaded. The young plants should be grown in a cold frame until the following spring, when, on starting into growth, they may safely be planted in an open border. Seeds are obtainable from flowering plants in large quantities, and they should be sown during the spring months. A little heat is necessary in raising seedlings, which should afterward be treated in the same manner as cuttings.

Cambridge, Mass.

M. Barker.

Hardy Ever-blooming Roses.—My attention was recently called to a very fine specimen of the *Gloire de Dijon* Rose. It was growing alongside a house, and had reached the second-story window. Its beautiful rosy salmon-colored flowers were still abundant, as they had been all summer long. It ought to be more generally known that this climbing Tea Rose is one of the hardiest of its class. It needs no protection at all here. Speaking of climbing Roses, why is it that the *Crimson Boursault* is so seldom seen? It is true that it blooms but once a year, but many less handsome ones do no more. Its crimson flowers are most beautiful, and then, as with all *Boursaults*, it is almost free from thorns. Among Tea and Bengal Roses which live out with little or no protection here are the following kinds: Archduke Charles, rosy crimson; Malmaison, flesh and fawn; Sombrieul, creamy white; Homer, salmon and rose, beautiful in the bud; Hermosa, rosy pink, and Marie Ducher, salmon-rose. We plant these sorts in sheltered places near dwellings, or in borders where hedges protect them a little, and this is all the care they get in winter. Their tops are frozen down more or less, but as these Roses want a good pruning in spring this does not hurt them.

Germantown, Pa.

Joseph Meehan.

Correspondence.

Rambling Notes from the Ozarks.

To the Editor of GARDEN AND FOREST:

Sir,—One of the features of the Ozark Hills is the essentially local character of many of the trees and plants growing there. In the course of considerable wandering over half a dozen counties of south-west Missouri and north-west Arkansas, all in the Ozark Mountain region, I have found *Gentian puberula*, *Cypripedium spectabile* and *parviflorum* and an unidentified species of *Tillandsia* in widely detached localities, though often quite abundant in those places. I know of but two places in our county where the beautiful yellow Dog-tooth Violet is to be found, and of but one locality each where *Lilium Canadense* and the common Cat-tail are indigenous. Within a radius of one hundred and fifty miles of this place I have but once found Beech, Pecan, Shag-bark Hickory, Linden and Liquidamber, among trees; Black Alder, Wahoo (*Evonymus*), Leatherwood, *Celastrus scandens*, *Clematis Pitcheri*, *C. coccinea* and *C. crispa* and Wild Hop, among shrubs and vines; *Oenothera Missouriensis* and *O. speciosa*, *Viola pedata* alba, *Clitoria Mariana*, *Iris hexagona*, *Hepatica triloba* and *Cypripedium candidum*, among herbaceous plants; and *Nelumbo lutea*, *Nymphæa odorata* and *Nuphar advena*, among water-plants. Of course, there are many species of trees and plants that are common to all this region, but this but emphasizes the fact that other species, seemingly as robust and capable of dissemination, are to be found only within circumscribed limits, often but a few rods in extent. Probably the geographical position of this range explains the matter, extending as it does between the northern and southern portions of our great country. A close observer notices that many species common in the north are only occasionally to be found here, while there is quite a sprinkling of species generally found considerably farther south. The flora of the Ozarks has been very imperfectly collected. The lax cattle laws have caused many rare plants to be lost in the thicker settlements by the incessant browsing and trampling to which they have been subjected, but in the wilder mountain regions it is probable many valuable intermediate species can yet be found. It

is a thousand pities we Americans have to wait until our wild flowers are gone before we awake to their value.

July and August were hot, dry months in the south-west. A trip through the valleys at this time showed that the display of wild flowers was greater than the average display of cultivated flowers in village and country door-yards. There the early annuals had been burned up by the heat, and the autumn flowers were not yet in bloom. Not so the field and wood. The dry and rocky hillsides were dotted with white *Euphorbia corollatas*, rose-purple *Echinaceas* and the great purple-throated blooms of *Ipomœa pandurata*. The fence corners were fringed with scarlet *Silene Virginica* and magenta-colored *Callirrhœs*, while the meadows were seas of gold and white and pink, where the *Coreopsis*, *Sabbatias* and *Erigerons* nodded their countless blossoms in the summer breeze. Mother Nature's garden is always full, in spite of drought, because of her abundant supply of deep-rooted perennials and heat-loving, drought-enduring plants. There is a lesson in this for each of us, if we would but take it.

Another lesson we might learn with profit from a midsummer outing is the great value of fine-fruited plants. We used to think plants were only worth growing for flowers; then we learned to appreciate fine foliage as well; now we need to learn that few things are more attractive in midsummer, autumn and winter than plants and shrubs with beautiful fruit. How full the woods are of pretty things in that line! There are hundreds of dusky crimson spikes of *Rhus glabra* gleaming in the sun like jeweled passementerie, acres of the *Symphoricarpos* or Indian Currant, with their coral-like sprays of tiny red berries; there are bead-like fruits on the Black Alder, the Spicewood and *Cornus*, long strings of shining black berries on the Pokeweed and huge umbels of purple-black Elder-berries. To these we may add the homely fragrance and the dainty green of the wild Hop, the curious clusters of the Bladder-nut and the equally curious pale brown, warty clusters of Buckeyes. Nature has something for every season.

Pineville, Mo.

Lora S. La Mance.

The Sierra Nevada Forests.

To the Editor of GARDEN AND FOREST :

Sir,—An association styled "The Sierra Club" has recently been incorporated at San Francisco "to explore and render accessible the mountain regions of the Pacific coast; to publish authentic information concerning them; to enlist the support and co-operation of the people and the Government in preserving the forests and other natural features of the Sierra Nevada Mountains." Among the incorporators are many of the leading citizens of the country. The University of California and the Leland Stanford, Jr., University are represented upon the Board of Directors.

The beautiful forest-growth of California, its gigantic Redwoods, its magnificent Douglas Spruce, its glorious Pines (*P. Lambertiana* and *P. ponderosa*) are noted the world over. Hidden among these great trees, in shady recesses, are the sources of many living springs, which supply water to the plains below, thirsting for irrigation, and carry wealth, beauty and prosperity wherever they flow. While it is true that the snow-capped peaks of the Sierras furnish an ever-living water-supply to the rivers of California, still the forests, with their soft loam and deep-cut cañons, are in turn natural cache-basins, retaining the supply of moisture and gradually measuring it out to the surrounding country as regularly and as automatically as the flood-gates of a reservoir. If the forests are destroyed the water will rush down the rocky cañons and bare mountain-slopes without restraint, as is now the case in all the mountain torrents above the timber-line.

In the timber-regions no care is taken to prevent fires which every year destroy leagues of forest which a century cannot restore. Again: after the tree is felled by the lumbermen only one or two of the end or butt logs reach the mill, and the remainder are left to rot or to furnish material for a conflagration when the first careless mill-hand or sheep-herder passes by and builds his camp-fire.*

The State Board of Forestry of California recommends the withdrawal of the remaining unsold timber-lands and advocates laws to regulate the amount cut each year by the timbermen in order to prevent this wholesale destruction. The men who have formed the Sierra Club will aim to bring these matters to the attention of the people of California and create a public sentiment strong enough to be recognized by Congress,

* Mr. Hubert Vischer, C. E., in First Biennial Report Cal. State Board of Forestry (Appendix "A"), states that only seventy-three per cent. of logs cut are actually sawed.

so that prompt and efficient means may soon be used to preserve these natural parks.

These men are lovers of nature, but it is not sentiment nor a desire to interfere with a legitimate business of timber-cutting that influences them in this work. It is rather a conviction that the future agricultural development of the Pacific coast is at stake, and can only be secured by adopting some efficient means for preserving portions of the coniferous forests, which are the natural reservoirs of the Sierra Nevadas.

San Francisco, Cal.

Mark B. Kerr.

Fungus Troubles in the Orchard.

To the Editor of GARDEN AND FOREST :

Sir,—The Apple-leaf blight has been serious in Kansas this year, if we may judge from the following extracts from a letter written by a leading pomologist in that state. These statements are interesting in connection with the current discussions upon the Apple-scab :

"I am satisfied that the almost total failure of our apple-crop is due to the same cause as the failure in western New York two years ago—an extremely low temperature and excessive humidity prevailed before, during and after the blossoming-period, which augmented fungus growth. The leaf-growth was deformed, contracted and weakly, and the small apples, not larger than a small-sized marble, showed the presence of the fungus in a remarkable prevalence, as it caused about all the fruit to drop off, and the few which held on were so scabbed and distorted as to be hardly recognizable as apples, and soon after dropped also. Later on, the leaves showed the rust-colored spots, while the first growth curled up, and many dried up and died. The injury in old bearing orchards was quite noticeable in the later growth, which appeared stunted; at least, the development was not freely made, and below the standard of healthful trees.

"The present year is the first in the history of the country which has developed these conditions, and our people were unprepared to protect the orchards because not expecting such an attack. The same cause developed the Raspberry-rust to an alarming extent, and in some plantations the canes midway are as denuded of foliage as in winter-time. This, it seems to me, must weaken them and render them susceptible of injury by the winter's cold, and therefore materially lessen the next year's crop."

Cornell University.

L. H. Bailey.

A Good Hybrid Anthurium.

To the Editor of GARDEN AND FOREST :

Sir,—*Anthurium Greyanum* is one of the finest of the *Andreanum* section, and is a hybrid between that species and *A. ornatum*. The foliage is intermediate between the two, having the compact habit of *A. ornatum* and the bright foliage and free habit of *A. Andreanum*. The flower rises well above the foliage and is very attractive; the spadix, red-brown, two and a half inches long; spathe open, cordate-ovate, pure white, two inches across and three inches long. The name was given in compliment to William Grey, of Albany, New York, by whom it was raised.

Orange, N. J.

R. M. G.

Chrysanthemums at Short Hills, New Jersey.

To the Editor of GARDEN AND FOREST :

Sir,—Messrs. Pitcher & Manda seem to win a fair share of the prizes in the various Chrysanthemum shows each year. It is doubtful, however, if their greatest prize is not the reputation gained each season in their nursery. As is well known, they invite their friends several times each year to special exhibitions of plants and flowers. As the years go by these invitations seem to be accepted in increasing numbers, as visitors have found there a constantly enlarging and well-kept collection of fine plants. It is perfectly true that not even at the largest and best-furnished public horticultural show can a visitor see a tithe of the plants always on exhibition under these acres of glass. Then, again, there are people who enjoy flowers free from the blare of trumpets and the glamour of electric-lights. This week, as is their annual custom, the United States Nurseries opened the Chrysanthemum season with a private exhibition, at which were shown all the flowers which, later on, will be entered in the numerous exhibitions in all sections of the country. The Chrysanthemum-plants filled four of the largest houses of the hill-ranges. Each of these houses is some 250 feet long by sixteen feet wide, from which one familiar with the ample flowering habit of the plant

may gain an idea as to the mass of color. This same mass of color is usually the principal thing one finds to criticize at a Chrysanthemum show. Even when furnished with good foliage and helped by backgrounds and separating foliage-plants, the profusion of flowers and glare of color are apt to produce bewilderment and confusion rather than a well-defined enjoyment. In the upper house the plants were arranged for effect in a very tasteful way with sloping, irregular side terraces, and the main floor occupied by specimen plants, arranged cunningly, so that as far as possible as one followed the winding paths the beauty of each specimen could be enjoyed separately. And while the house was filled with flowers by the thousand, at no point of view was the scene oppressive. Two houses were filled with the new seedlings of the year under trial. There were said to be 30,000 of these, apparently a not excessive claim, as they were grown to single stems and planted in boxes at six inches apart. The lower range contained a selection of plants in readiness for the Madison Square Exhibition, where, no doubt, they will be heard from.

There was much to interest a Chrysanthemum-expert. In the first place it may be said that the plants were never grown so well here before. Good, strong, fine wood and well-developed foliage was the rule. It is always interesting to find new marvels, but one finds equal interest in observing how the marvels of former years are doing. It was pleasant to see so many of the former introductions of this nursery still showing their first form. To mention a few, Miss Annie Manda is a pure white incurved hairy kind, having the depth which the Mrs. Alpheus Hardy lacks. The Hicks Arnolds are again great balls of golden yellow. Mrs. E. D. Adams has improved each year, and is a massive white. A. G. Ramsey, when well grown, is a fine reflexed carmine, very telling. Mrs. Lewis is a very charming reflexed flower of a very pure clear yellow of medium depth. The great bronze Harry May was not seen in its former profusion. Mrs. Grace Hill, Mrs. W. A. Kimball and Mrs. Hood Wright seem to be a few of the other kinds which will probably stay.

One does not often have a chance to examine 30,000 new flowers, and the two houses occupied by these afforded a very striking illustration of the sportiveness of the Chrysanthemum. We are familiar with the fact that of so many thousands of human beings no two will be found exactly alike in appearance. We are not so familiar with the fact that we have a flower, of which two identical seedlings will hardly be found among many thousands. And this is the case even when many of the seedlings have the same parent. Of the seedlings here, a record had been made of the seed-bearing parent, and the flats of plants all bore pedigree-labels. Presuming this had been done with accuracy, the results were remarkable, each lot showing the widest possible diversities both in color and form, and often with no trace of likeness to the special variety from which it had sprung. A large number of hairy kinds in all colors and forms were seen, probably hybrids from Mrs. Alpheus Hardy, the female parent of very many of the new seedlings. Mr. Manda also claims to have secured from this variety many of his most distinct or fancy colored flowers, which he had in large numbers. Looking over the various flowers one could realize why each season so many new varieties are offered, for there seemed to be literally hundreds of first-rate flowers which any one would hesitate to discard. The new selections of the season were as yet unnamed, but some of the most promising numbers were No. 8, a fine spotted variety; No. 92, light yellow, reflexed; No. 42, incurved, white; No. 74, Stars and Stripes, white, striped red; No. 60, incurved, yellow; No. 78, salmon-pink; but it seems useless to detail under dry numbers the flowers which, no doubt, will soon be christened into the feminine gender.

The exhibition is primarily one of Chrysanthemums, because Chrysanthemums are just now in season, but no visitor to the nurseries will leave without at least walking through the great house where, under an acre and a quarter of glass, there are enough Palms to stock the Horticultural Building at Chicago if each one had all the room it needed. Two hundred and thirty species and varieties are represented here, and some of them are truly magnificent specimens. Here are Arecas, Kentias, Thrinaxes and many more with stems twenty feet high; besides Tree-ferns, a hundred of them, and many with trunks at least as long as the Palms, and several of them two feet in diameter. Under the broad and arching foliage of these Palms and Ferns and Cycads, of which there are some twenty-seven species and varieties, the visitor walks as if in the dusk of a tropical forest, while at the bases of the stems are masses of rare Ferns and other shade-loving tropical plants.

On either side, and opening into the Palm-house, are long ranges filled with stock plants in wonderful variety and in such

abundance as one rarely sees. One house is filled with *Kentia Belmoriana*, another with *K. Fosteriana*, a third with *Areca lutescens*, and a fourth with *Cocos Wedelliana*. Another still contains *Marantas*, *Crotons* and other stove foliage-plants, while the next gives space to nothing but *Anthuriums*, and the one beyond shows *Alocasias*, *Nepenthes* and the like. The house of *Dracænas* was conspicuous not only for the great number of well-grown plants it contained, but for the magnificent Stag-horn Ferns which ornamented its entrance, one variety in particular with a splendid shield being one of the most attractive plants in the whole collection. No one realizes the full decorative value of the *Auracaria* until a mass of it 200 feet long is seen; and beautiful as is a specimen plant of *Adiantum Farleyense*, a long house with both the centre and side benches completely covered with its soft foliage, gives one a new idea of its delicate and airy grace.

Of course, there are Orchids in bewildering profusion in the three ranges, each 500 feet in length. One is not surprised to learn that there are 2,800 seedling *Cypripediums* alone, and that the house which is filled with *Cypripediums* for flowering is 130 feet long. Just now the rare and beautiful little *C. Fairreanum* is in flower, and it seems to have a particularly tender place in Mr. Manda's regard, not only for its beauty, but because it seems gradually to be dwindling out of cultivation. He is fortunate in having among his prizes in bloom a hybrid between this species and *C. Spicerianum*. Of the other Orchids in flower which cannot be omitted are two distinct and charming varieties of *Vanda Sanderiana*, many fine examples of *Vanda cerulea* and the rare and beautiful hybrid *Cattleya Exoniensis*.

New York.

X.

Periodical Literature.

An interesting article in the October *Bulletin of the Torrey Botanical Club*, written by Mr. William T. Davis, describes the discovery on Staten Island of what he believes to be a new hybrid Oak. Near Watchogue, he says, grow numbers of the Black Scrub Oak (*Quercus ilicifolia*), associated, especially in the drier situations, with many Black Jack Oaks (*Q. nigra*). These species are easily distinguishable. *Q. ilicifolia* is not usually a tree, but a shrub. But, accompanying many normal specimens of both species, Mr. Davis noted many others, which, "when taken together, form a series leading from one species to the other, and apparently are hybrids resulting from the cross-fertilization of the two. Though these trees vary considerably, individually they resemble *Q. nigra* in being erect and rigid in growth, in their short, abruptly tapering branches, and in having the leaves rusty pubescent beneath. They resemble *Q. ilicifolia* in being small, in their smooth, light-colored bark, and in the retention of their dried catkins in abundance throughout the summer. . . . One of the trees that bears the greatest resemblance to *Q. nigra* is erect in growth and about eight feet high, and the leaves vary in shape from the *nigra* form to that of *ilicifolia*. They are more rusty pubescent beneath than those of *Q. nigra*, and the tree has a lighter appearance, owing principally to the color of its bark. Only two or three partly broken cups of last year's acorns remained on its branches, for it bore no fruit this year, but it retained its dried catkins in abundance.

"Another tree, that is about six feet tall and has the under surface of the leaves rusty pubescent, bore two abortive acorns this year, but retained its catkins. Still another tree, near by, is erect, about six feet tall, and has the leaves whiter beneath than the last. It bore no acorns, but, like the other trees, retained its catkins. None of the remaining trees so far discovered, the tallest of which is fourteen feet high, bore any fruit at all this year.

"At the other end of the island, at Rossville and Tottenville, *Q. nigra* grows abundantly, but *Q. ilicifolia* is absent, and a diligent search at these places resulted in the discovery of no such trees as those to be found at Watchogue."

In the list of hybrid Oaks contained in the last edition of Gray's *Manual*, two hybrids are described and named of which *Q. nigra* is a parent, and one of which is the offspring of *Q. ilicifolia*. But no hybrid between these two species is noted, and, therefore, as it is recognizable enough to deserve a name, Mr. Davis proposes to call it *Quercus Brittoni*, "after Dr. N. L. Britton, who was born on the island, and who, with Mr. Arthur Hollick, has done so much in making known its flora."

Notes.

We rarely hear the *Forsythias* spoken of on account of the beauty of their autumn coloring, yet these shrubs, although they begin to turn early to a rich chocolate-brown, hold their

leaves for a long time, and are still very beautiful, especially as the sun shines through them, when they show a very deep crimson tint.

At the Chicago Fair, Apache County, Arizona, will exhibit a collection of petrified woods from the famous forest-region along the Little Colorado River. Specimens of these singularly perfect petrifications, some of them enormously large, have been seen in this city, but will doubtless be new to very many visitors at Chicago.

The Chamber of Commerce of the twin cities of Winston and Salem, in North Carolina, at its last meeting passed a resolution recommending the Legislature of the state to acquire and preserve a portion of its forest-area, and urging upon the General Government the desirability and importance of a national park in the southern Alleghenies.

It is not usual to find Sweet Peas blooming in the open air on the 1st of November, but if the flowers are cut off every day the plants will always bloom until severe frosts. The unusually warm autumn has prolonged the season this year, and within a few days we have seen a beautiful bunch of these flowers picked from a row which had been blooming since July.

The proprietors of *Harper's Magazine*, in their announcements for the coming year, promise some illustrated studies of the old gardens of Italy, by Mr. Charles A. Platt, the well-known landscape-painter and etcher, besides other articles on "Our great pleasure-grounds in park and forest," while in another publication of the same firm Mrs. Candace Wheeler will write of "Color Effects in the Garden." This recognition of the fact that gardening is enough of a fine art to attract the pen and pencil of artists in other branches, and that it is a topic of sufficient popular interest to command an important place in leading periodicals devoted to general subjects, is certainly a gratifying one to all who love gardens.

Mr. E. H. Forbush, director of the field-work against the Gypsy Moth in Massachusetts, writes to Mr. Fernow, Chief of the Division of Forestry, to say that the insect-lime recommended by him (see GARDEN AND FOREST, vol. iv., p. 142) had been given a very thorough trial during the past two seasons. About four tons of the material have been used, and it was pronounced more useful than anything that the Commission has been able to secure or manufacture for the same purpose. The lime received from German manufacturers retained its freshness for a long time, and its only fault was that it hardened during cold storms and occasionally on cold nights, so that the insects could climb over it. If properly applied and watched it is very efficient, and seems more useful in woodlands than on street-trees, where the dust is continually flying.

Providence journals have recently stated that Neutakonkaut Hill will probably be bought by the city and reserved as a public pleasure-ground. The tract so called lies just outside the city limits on the Plainfield Pike. Part of it is level and covered thickly with woods, scattered among which are small farms, while another part is described as a "series of natural terraces, strewn with immense boulders, with here and there a giant Oak." From the highest point in this portion an extensive view of Providence may be had. From another elevation Fall River can be seen, and, in still a third direction, the wide and beautiful panorama of Narragansett Bay. A pond is also included within the limits of the indicated tract, and, as it thus seems particularly well adapted to its proposed purpose, its acquisition will doubtless be a matter of general rejoicing, especially among the large manufacturing population of the town, for, while Providence already possesses a number of small parks, it has as yet no large, varied and wooded tract suitable for popular refreshment on a generous scale.

Mr. F. V. Coville writes in a recent number of the *Bulletin of the Torrey Botanical Club* with regard to his rediscovery of a Rush (*Juncus Cooperi*), which was described as new by Dr. Engelmann in 1868 from a single specimen, without leaves or root-stock, collected seven years before by Dr. J. G. Cooper in San Bernardino County, California. It has since been known only through this single specimen, although Mr. Coville explains he has recently found another in the National Herbarium, falsely labeled *Juncus compressus*, and accredited to the Colorado Desert in California. In January, 1891, he tells that an expedition sent out by the United States Department of Agriculture, entered Death Valley and encamped at Bennett Wells. Near this camp, and in several other places in this same region, he found *J. Cooperi* in fruit, standing on the borders of a salt-marsh amid vegetation peculiar to this alkaline region, "in tufts sometimes composed of only a few stems, or occasionally attaining the extraordinary diameter of two metres."

A full description of the plant, drawn up from these living specimens, accompanies Mr. Coville's account of its rediscovery.

About a year ago GARDEN AND FOREST told the story of the creation of Highland Park (see vol. iv., p. 553), which was secured for the old village of Jamaica, Long Island, by an organization of public-spirited women. One of the interesting features of the ceremonies of Columbus Day in Jamaica was planting memorial trees in this park under the auspices of the Linnean Club. Trees were planted in honor of Columbus and Isabella, of Mr. Brinkerhoff, who gave half the cost of the land in the park, besides one in honor of each of the original incorporators of the Park Association. During the exercises it was announced that Mr. Henry A. Van Allen had given an acre of ground which bordered on the pond, of which the association owns only a part. This donation is the first step toward obtaining control of the entire shore, and a "Van Allen tree" was very properly added to the collection. The trees were planted under the direction of Mr. Henry Hicks, of Westbury, Long Island, a graduate of the School of Horticulture in Cornell University, and since he took a special course in landscape-gardening there is reason to believe that the trees are not only carefully planted but properly selected and placed.

A French writer having stated that, so far as he knew, the Purple Beech had never been planted as an avenue-tree, the *Monthly Bulletin of the Horticultural Society of Mons* recently informed him that an avenue of Purple Beeches, still young but flourishing, exists in that part of the forest of Soignies, which lies near the Boisfort race-course. We may say, in our turn, that a fine avenue of large and well-developed Purple Beeches is a conspicuous feature of an old country-place near Boston, the trees varying in color from a true purple to a rich dusky bronze. Few persons will regret that avenues of this kind are infrequent. Green is nature's color, in the sense that it is the only color which she uses in large masses of foliage. The original Purple Beech was a "sport" from the common species. It was wise to propagate it for garden use, as a single bronze-colored or purple tree as beautiful in form as the Beech, used as an accent to relieve great expanses of green, may be advantageous in a diversified landscape-gardening scheme. But the presence of even two or three such trees can seriously disturb the repose and unity of a lawn or plantation; and an avenue of them, while appealing, by its conspicuousness and rarity to the wonder of some observers, can never be as appropriate or beautiful as an avenue of green trees of this or another species.

The monument to the memory of Audubon, which was projected for this city some time ago by the American Association of Science, is nearly completed and will be unveiled by the great naturalist's granddaughter before the first of December. It will stand in Trinity Cemetery, near the Audubon family vault, and will eventually face Audubon Avenue, as this street is to be cut through to 155th Street. The Audubon family once owned all the tract of land lying between the Hudson River, Tenth Avenue, 155th and 158th Streets, and a portion of it is now called Audubon Park, although it is not a public property, consisting of a group of villas, surrounded by more or less extensive grounds. Some contributions for the monument came from other states, but the major part of the money was raised in New York, largely by the exertions of Dr. Egleston, of the Columbia College School of Mines. It is composed, we are told, of a large square block of bluestone, bearing a relief-portrait of Audubon and various appropriate emblems. This is surmounted by a Celtic cross, nineteen feet high, carved with characteristic Celtic designs, in which basket-patterns, flowers, birds and animals are interwoven, and with Biblical inscriptions on the panels at its base. The scheme is evidently a good one, but one may doubt whether the execution of it will be as good, for the work has been done in a stone-yard, without the assistance of any artist whose name is familiar to the public.

Catalogues Received.

DAMMANN & Co., San Giovanni a Teduccio, near Naples, Italy; Flower and Vegetable Seeds, Seeds of Shrubs, Conifers, Palm and Fruit Trees, Bulbs.—E. HIPPARD, Youngstown, Ohio; Standard Ventilating Machinery, Standard Hose Mender.—WM. S. LITTLE, Rochester, N. Y.; Ornamental and Fruit Trees, Fruit-bearing and other Shrubs, Vines, Roses, etc.—HUGH LOW & Co., Clapton Nursery, London, N. E., England; Wholesale Trade-list of Orchids, Palms, Ferns, Shrubs, Trees, Roses and other Flowering Plants.—PITCHER & MANDA, United States Nurseries, Short Hills, N. J.; Select Plants for Artistic Decorations, Hardy Perennial and Herbaceous Plants for Fall Planting.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLES:—The Beautiful in the Surroundings of Life.....	529
Encouraging Children in the Intelligent Planting and Care of Trees..	530
Mount Desert—A Foreigner's Impression.....	<i>Cecilia Waern.</i> 530
Botanical Notes from Central Texas.....	<i>E. N. Plank.</i> 531
Mid-October in West Virginia.....	<i>Mrs. Danske Dandridge.</i> 532
PLANT NOTES:— <i>Dendrobium chrysotoxum.</i> (With figure.).....	<i>A. Dimmock.</i> 534
NEW OR LITTLE-KNOWN PLANTS:— <i>Halesia tetraptera Meehani</i> (With figure.)	<i>C. S. S.</i> 534
FOREIGN CORRESPONDENCE:—London Letter.....	<i>W. Watson.</i> 534
CULTURAL DEPARTMENT:—Plants for Summer Decoration.....	<i>Wm. Tricker.</i> 536
Foliage-plants.....	<i>W. H. Taplin.</i> 537
Wintering Strawberry-beds.....	<i>O. W. Blackenall.</i> 537
CORRESPONDENCE:—Forests in California.....	<i>Carl Purdy.</i> 538
Late Flowering of Jackman's Clematis.....	<i>J. Woodward Manning.</i> 538
PERIODICAL LITERATURE.....	538
EXHIBITIONS:—The New York Chrysanthemum Show.....	539
NOTES.....	540
ILLUSTRATIONS:— <i>Dendrobium chrysotoxum</i> , Fig. 90.....	533
<i>Halesia tetraptera Meehani</i> , Fig. 91.....	535

The Beautiful in the Surroundings of Life.

MR. HAMERTON has well defined the word "landscape" as meaning "the visible material world, or all that can be seen on the surface of the earth by a man who is himself upon that surface." Wild landscape—the scenery of the natural world—possesses infinite interest and charm for those of us who live caged in towns and cramped in houses, and we greatly enjoy both traveling in search of it and reading the praise of it. No age of the world has ever brought forth so many delightful books about the woods, the mountains and the sea-shore. The beauty of natural scenery stirs us as does the finest music. As Mr. Symonds has noted, "there is a profound sympathy between music and fine scenery; they both affect us in the same way, waking strong but undefined emotions which express themselves in 'idle tears' or evoke thoughts which lie, as Wordsworth said, 'too deep for tears' beyond the reach of any words." It seems as if our extreme delight in the beauty of wild landscape, tending, as it seemingly does, "to destroy habits of clear thinking and to sentimentalize the mind," had caused us to overlook for the time the supreme importance of that part of landscape which is necessarily not wild—the landscape of our daily lives—the humanized scenery of the earth. This prevalent carelessness concerning the landscapes of every-day life is something remarkable. Here are our rich men paying enormous sums for painted landscapes to be hung in their houses while they permit the real landscape about them to become ugly in the extreme. Here are poorer people spending liberally for journeys in search of the picturesque while what might be the picturesqueness of their own neighborhood is unperceived or destroyed.

But there are signs that a better day is coming. Some parts of our great America are even now beginning to stir with eager desire for beauty. It is true, the desire is unformed, and our work is too often based upon mistaken conceptions of that beauty which is our hope, and yet we

must be thankful when the desire appears among us, for it is something which distinctly ennoble the life of every man and nation in whose heart it is born. Possessed by it, we are compelled to strive and strive again to find "the secret of the beautiful," the foundation upon which beauty is built, the nature of that growth of which beauty is the flower. We shall make our mistakes like other men. We shall attempt to attain our heart's desire by forbidden and impossible ways. We shall probably fell noble forest-trees to make room for brilliant exotics. Perhaps we shall curve our roads because we think we like curves, or build our houses according to some pattern we admired in a foreign land. But, even so, there is hope for us. We shall learn in the end. And, meanwhile, so rash and willful and so generally unsuccessful are we in all this field of work that it may be worth while to look back for a moment over the long story of the evolution of landscape in the hope that we may find therein that key to the secret of the really beautiful which we seek.

Not to name others, Mr. Ruskin, in his early essay on the Poetry of Architecture, has been before us here. He finds man in primitive ages living precariously upon wild nature, and causing little or no change in the appearance of the wilderness around him. When, at last, he is forced to increase his food-supply, he takes some wild thing like maize and plants it in the glades of the forest, and stores the crop in granaries set up on stakes. When he desires to shelter himself, he contrives frail tents like the Bedouins or the Red Indians, or he walls the mouths of cañon caves, or he builds earthen pueblos hardly to be distinguished from the arid ground on which they stand. As he comes to cultivate broad stretches of the earth, he works marked changes in scenery. He fells the woods and marks off fields and draws lines of roads across the country. He plants avenues and orchards, he makes gardens and vineyards, he builds farmsteads of as many types as there are differing climates and differing social circumstances, he builds villages and cities, he rears palaces and temples, doing all to meet his needs and to express his life; and so long as he is sincere and straightforward in his work, mother Nature stands ready to adopt it as her own, and to make of it landscape rich in meaning and pathos such as no primitive wilderness can show.

Look for a moment upon a typical valley of the interior of our own New England. We are standing upon the eastern wall of upland. The village, with a mill or two and a church or two, lies below us at the mouth of a gap in the northern hills. Southward the valley broadens to contain a fresh green intervale. Opposite us the western wall of the valley is an irregular steep slope of rising woods, with numerous upland farms scattered along the more level heights above. The central intervale, the flanking woods, the village gathered at the valley's head—the whole scene before us possesses unity and beauty to a degree which interests us at once. And how was this delightful general effect produced? Simply by intelligent obedience to the requirements of human life in this valley. The village grew what it is for the sake of nearness to the great water-power which rushes from the gap in the hills. The intervale was cleared and smoothed for raising perfect hay. The steep side hills have been maintained in woods because they are too steep for agriculture, and because, if they were cleared of trees, their sands and gravels would wash down upon the fertile land of the intervale. Similarly upon the upland farms, the greenery along even the tiniest brooks has been preserved in order to obviate that wasteful washing away of soil which results from carrying plowing to the edges of the water-courses. Throughout the landscape before us it is most interesting to note how beauty has resulted from the exercise of common sense and intelligence. The every-day forces of convenience, use and true economy have here conspired with Nature to produce beauty, and this beauty is of a very different and much more satisfying kind than that which tries to found itself on mere caprice or fashion.

If, now, we search the world over, do we not find the same truth everywhere? Let us call to mind some of the loveliest of earthly scenes. The red farmstead among the Firs of Sweden, the Ilex-trees and the white villas of the steep bank of Como, the English deer-park and its stately mansion, the towered village of the Italian hills, the broad green and the great Elms of our own Hadley or Deerfield. The beauty of these memorable humanized landscapes is nothing extraneous; it is not something added to the landscape after the main lines have been laid down; it springs directly from the fact that these fields, trees, ways and buildings have been arranged first with reference to the needs, uses and enjoyments of real life in their respective lands and climates, and it is their perfect conformity to these principles which constitutes the essence of the beauty we admire. Not by display of knowledge of the styles of architecture and gardening; not by gathering in one place all the trees of the earth; not by imitating the beautiful features of the scenery of foreign lands and climates; not by copying wild nature in places which are not wild; not even by attempting to obey the laws of landscape-painting, will beauty ever be won to dwell among us in the surroundings of modern life. "All that would be fair must be fit." There is no other way to win the beauty we desire.

This truth being accepted, what shall we of this too self-conscious age say to our gardener and our builder when we set out to make "a place of our own"? To the first it must be: Lay out no road or path which is not the most convenient possible in the circumstances. Lay out nothing for mere flourish, but all for use or rational enjoyment. Fell and plant and choose the kinds of plants for good reasons only. In all you do, have constant reference to the general scheme of the whole place.

To the builder we say: Plan for convenience first and always. Take advantage of every peculiarity of the purpose, the site and the exposure of the building. Let the exterior of the building faithfully represent the interior, and shape it not as a thing apart, but as the central object in a larger design. In placing doors which involve paths; in arranging drying-yards, kitchen-courts, piazzas and terraces; in all you do, have constant reference to the general scheme of the whole place.

And who shall conceive and insist upon this general landscape scheme in the perfecting of which the artist gardener and the artist builder are to play their respective parts? In these days it is seldom that the need of such a broadly inclusive scheme is realized even by the artists who have part in the work, much less by the managing owner; and yet the time is coming when the landscape-architect, whose province is just this arranging of the building and its surroundings to form one landscape, will be welcomed alike by owner, builder and gardener as the man who will cause the work of each to count for beauty much more effectively than it otherwise can. When this day comes, and either the owner, the gardener, the builder or the professional specialist is looked to as the deviser of a general landscape design based on purpose and fitness, and not upon caprice; then, again, there will be hope of finding the really beautiful in the surroundings of daily life.

OUR attention is called by the *Boston Commonwealth* to the fact that Samuel Sewall celebrated Columbus Day in 1692 by planting five Chestnuts. If these Chestnut seedlings had been carefully nurtured as memorials of the second centennial of the discovery of America, the great trees as they were about entering upon the third century of their existence would now be objects of the deepest veneration. We are glad to learn that in many places, as in the new park at Jamaica, Long Island, memorial trees have been planted this year in honor of the fourth centennial of the great discovery. Four hundred years hence, an Oak carefully planted now and duly nourished and protected from year to year, would have a value beyond that of merely

directing the attention of future Americans to the daring navigator who found the western shore of the Atlantic. We are beginning to be old enough to have a past, although our most venerable date is modern compared with those of European history. We scarcely realize how the doings of the day will look to the generations in the thirtieth century, who will turn to our records as we revert to those of the Ancient Britons and study the marches of Cæsar. It is a novel thing for us to pose for posterity, but the time has come when it will not be considered altogether frivolous on our part to have some care for statuesque effect a thousand years hence. If we now take heed to establish customs honorable and worthy of veneration we shall then have groves which will compel the same reverence as that with which we regard the park of the Druids and the Olives of Baïæ.

Any custom which encourages the intelligent planting and care of trees is worth establishing and cherishing. If forestry is ever to assume its proper place in public instruction, beginning must be made with the children, and we must impress upon them from earliest youth the value of trees in the economy of nature. They must be taught the importance of preserving our woods and be made to feel that it is the solemn duty of the generations to come to cultivate and guard these bulwarks of our national prosperity. No course of physics should be considered complete in our common schools or our higher institutions of learning which does not include the influence of trees upon agriculture and civilization. But the intellectual appreciation of the economical value of trees is worth a great deal more when this knowledge is vitalized by an admiration of their beauty and a genuine affection for them. Our forests will only be safe after we have become a nation of tree-lovers, and the foundation of this regard can be laid in no way so well as by enlisting the interest of children in individual trees. Memorial trees, grouped on school-grounds or supporting a town-hall, if they have been planted with some ceremony by the children of the place and entrusted to their care under the supervision of their elders, would become in time objects of deep personal regard. This affection for the tree by its planters and protectors will grow stronger as all grow together. No one who has developed a love like this for any one tree can witness the useless destruction of another without a feeling of pain and indignation; and we can never look for an assured protection of our woodlands until the mass of the people of the country are not only instructed as to the important function which trees perform in the economy of a civilized nation, but have been brought up from childhood with a growing appreciation of their beauty and a constantly deepening affection for them as if they were personal friends.

The Columbian anniversary, then, will be a genuine advantage to the nation, if it helps to establish the custom of planting and caring for memorial trees.

Mount Desert—A Foreigner's Impression.

THERE is much to sadden the heart of the lover of garden and forest on Mount Desert island. The sight of the woods is lamentable. One day we drove past mile after mile of half-grown, tangled, choked and airless woods, filled with falling trees and rotting rubbish, and rendered still more uncanny by the numbers of dead trees standing like dreary ghosts, that could not even move about, fettered in the stony soil. And when, after a few miles of this, I could not help saying that "I had never seen worse-kept woods," I fear I exposed myself to ridicule.

It was carefully explained that America had no need of forestry, and one would judge so indeed by the lavishness with which splendid logs were piled up in the generous fire-places. Yet wood is worth something in Boston, and the splendid logs themselves give little pleasure to one who sees them burning after he has observed that trees of the calibre they represent are none too many for beauty, that is the landscape beauty which ought to be such an important element in a summer playground.

Good forestry takes landscape beauty into account, and although it might seem ludicrous to propose, in a poorly populated district like Mount Desert, to thin out the rubbish which is such an offence to the eye of one accustomed to Swedish woods, yet at least the finest specimens might be left and a few more of the indifferent trees taken instead.

But the great end and aim of practical forestry is utility, and in this respect there is much to astonish the foreigner in the state of things on the large, wooded island of Mount Desert. We do not sweep our forests with a broom, as some Americans believe, but we treat them as we should any other valuable crop, trying to favor its growth and not leaving it to fight unaided against its enemies. It will not be long before America, at the pace she is going, will have to give up the fiction of youth, which is now offered as the excuse for all wastefulness, and begin to profit by the experience of her elders, who are bitterly ruing the day when they squandered their patrimony of seemingly exhaustless woods. The forest on Mount Desert seemed to me to be just in that stage of secondary growth when interference becomes imperative, both to preserve the fine trees and give them the opportunities they deserve and to make a good crop in the thickest places out of a poor one. Natural selection would ultimately do the work, but who has time nowadays to wait for the slow process of natural selection?

In the landscape-gardening here, good tendencies and successful results are seen side by side with what must be called perversity of taste. (I am not here speaking of Bar Harbor, which I did not happen to see.) Why spend untold gold in making and keeping a lawn on this rocky soil when the unobtrusive shingle houses, with their surroundings of bare rock and native Spruce, have a fascination which no one can resist?

Of course, there is something to be said for the lawns, too, as symbols of contrast, as a little glimpse of city luxury for those who care for that in the midst of this unkempt nature. Only to make the contrast telling the lawns ought to be of the most velvety and sparkling turf—ought to be framed in an immediate setting of wild woods, or be set apart by enclosures from the vulgarity of the semi-villages. Coarse villages are here even more than elsewhere a very poor substitute for the natural "wild garden" they have replaced, and the sight of expensive lawns, on which the hose is constantly spurting, surrounded by cheap houses and shops with plate-glass windows, only suggests a needless and tasteless outlay of money; and this is vulgarity.

However, I did see a few very successful combinations of lawn and wild scenery, and one in particular. The house is situated on a point at some distance from the main road, and communicating with it by a long straight drive, with the low brushwood on either side left quite wild except for a narrow strip of turf along the drive. Spreading lawns, studded with the beautiful natural evergreens of the region, surround the house on every side. On the inland side these trees are made to serve as a dark background for a set of bright flower-beds fronting the main entrance; on the piazza and sea-view side, the lawn is kept clear, save for groups of graceful Larches, Spruces and Pines that contrast effectively with the smooth gleaming turf and merge insensibly into the wild strips of wood left in places here and there.

But the most charming creation had no lawn at all. It made all the more impression on me for my coming on it one morning unawares after a week of perplexed wonder at the state of the woods and the lack of taste and the absence of any unity whatsoever in the arrangement, or non-arrangement, of the summer settlements. I had been seeing not only unkempt forests and human habitations grouped together in the ugliest possible way; I had also seen some splendidly wooded rocky promontories, plunging their dark masses into the clearest of tidal seas, and left unspoiled by the happy mortals who had there set up their summer abode; I had seen superb, far-spreading views, and some very beautiful, interesting and altogether satisfactory mountain-sides, which might have been in Sweden except that the place of the Red Oak, our pride and joy, was taken by White Pines and Pitch Pines, and that Moose-wood, White Maple and Yellow Birch mingled freely with the White Birches on the stony slopes. Yet all these beauties of nature only made me feel more keenly the mistakes in taste and want of care displayed, and it was in this frame of mind that I came upon the little "creation" aforementioned. It is a mere little log-hut or lodge standing by itself in the woods on the slope of the mountain of Asticon. It is dark brown in color, has a picturesque gable with some carving, a high foundation, and a raised, very effective, rough piazza along two sides of the house. It was closed, and with a very formidable padlock,

too, so I could prowl about freely. The site was exquisitely chosen, giving a view from the piazza that seemed the very essence of Asticon; the peaceful harbor cradled by wooded hills with the broad expanse of sea and islands beyond. The situation was full of the poetry of *Waldeseinsamkeit*, for which the German has so many condensed expressions and the English so few, and the whole place lying there silent, basked in the sun, among the mossy ledges and tall Arbor-vitæ, somehow like the wood-hut of The Three Bears. Very little had seemingly been done to it, but a great deal of thought had been put into it, and one little touch of visible art went very far toward deepening the charm. On the slope, in front of the piazza-steps, there was a thick grove of tall Arbor-vitæ. Through these a passage, or tunnel, had been cut, accentuated by a low stone wall, leading part of the way up toward the piazza, the whole giving a faint suggestion of foreign lands and conscious art, that only served to heighten the imaginative charm of the place.

Truly, the art of landscape-gardening does not always consist in spending a lot of money in transforming nature.

New York.

Cecilia Waern.

Botanical Notes from Central Texas.

THESE notes are written from the city of Lampasas, which lies in the north-west angle made by the intersection of the thirty-first parallel with ninety-eighth meridian. The city is situated in the valley of Sulphur Creek, and is the capital of a county of the same name. The creek takes its name from the numerous sulphur springs which issue from its bank or from near them, and keep up its perennial supply of water. Within the city limits there are two springs whose waters are so strongly impregnated with sulphur as to leave incrustations of that mineral upon the rocks and plants over which they flow. Each of the springs is the source of a little brook.

While Lampasas may be considered to be the base of these observations, still many of them were made in Burnet County and around the city of Llano. We are now in old Texas. The western part of Burnet County and portions of Llano County are very old—so old that they are considered to be synchronous with the Iron Mountains of Missouri, the Black Hills of Dacotah and the Laurentian Hills of Canada, and with them stood out as solitary far-separated peaks above the primeval sea long before the Rocky Mountains were upheaved. The ninety-eighth meridian, more nearly than any other, is the dividing line between the vegetation of eastern Texas and the Mexican flora of its western border. It is largely the common ground where adventurous species of both sections meet.

The characteristic tree of this region, and the most valuable one, is the well-known Pecan (*Hicoria Pecan*). When this species lays itself out for a supreme effort it attains a much larger size than its congeners, becoming a hundred feet tall and four feet in diameter. An important and growing trade in pecan-nuts already adds millions of dollars to the wealth of Texas farmers. A large tree under favorable conditions may produce ten bushels of nuts in a year. Live Oak is, next to Post Oak, the commonest Oak in central Texas. It also attains a larger size than any other Oak attains here. A peculiarity of this species is the formation of dense groves, "mottes," sometimes covering only a few rods, sometimes several acres of the other naked prairie. I asked a native Texan for the origin of these groves that form so distinctive a feature of the landscape of central Texas. He replied, "They come from the roots of some old tree that is now dead and rotted away." They may have come from the thousands of acorns which some old now-gone tree had planted. *Quercus Durandii*, *Q. nigra*, *Q. macrocarpa* and *Q. coccinea* are also here. Hackberry (*Celtis*) in several forms is common. Whether the numerous forms under which it appears constitute a single species or more than one is a question for systematists. If there be more than one, there are probably four. Botanists have nothing to do with making species. They have only to learn, if possible, how many species Nature has made—whether one or a dozen of a genus they should not care. The question then comes up, What is a species? There the trouble begins. It may be true that sometimes with too much freedom we dignify slight variations of form in plants as varieties, and couple too many specific names with the hybrid symbol without having made one experiment to learn if the united species would hybridize, or, if they will hybridize, that the hybrid is like the form that we have found. It may also be true that in our desire to do original work we have not given sufficient prominence to the range of individual variation in plants—a variation that may fill the entire gap between species without ever crossing the line that separates them.

White Elm (*Ulmus Americana*), *U. crassifolia* and *U. alata* are abundant. What I suspect to be *U. crassifolia*, as I have no description by me, is at this writing in full-ripe fruit. It blossoms late in summer, and, like other Elms, takes a few weeks only to ripen its fruit. There is also an Elm here in fruit with strongly winged branchlets. Near Fort Smith, Arkansas, *U. alata* was loaded with nearly ripe fruit as early as the 1st of April.

The Button-bush (*Cephalanthus*) is common along streams, and the species is sometimes arborescent. I have seen individuals nine inches in diameter. Wild Black Cherry (*Prunus serotina*) grows near Burnet. Wild Plum (*P. Americana*) is abundant. The handsome little shrub *Dalea frutescens* is common on the summit of Post Mountain, and there the western Honeysuckle (*Lonicera albiflora*) begins to appear.

Vernonia Lindheimeri is everywhere on the limestone hills of central Texas. On richer soils lower down the hillsides, a handsome *Erythraea* during the month of August covers the ground with its bright pink flowers.

Mesquit (*Prosopis juliflora*) is nearly everywhere, and Texas would hardly be Texas without it. With wood serving for fuel, and seeds for animals, and for human beings when hunger pinches, it is invaluable for beast and man. Usually a small tree, it often becomes sixty or seventy feet tall, and two feet or more in diameter.

In rocky places, conspicuous by its long lithe branches covered with small, white and sweetly scented flowers, grows *Lippia ligustrina*. It is often seen in cultivation, to which its beauty and odor entitle it. There is no Texas shrub whose flowering sprays are better adapted for delicate, odorless bouquets. *Eysenhardtia amorphoides*, a small shrub of the Pea family, is often found in company with *Lippia*. Although burdened with such a name, it bears handsome white flowers that are pleasantly odorous. Soapberry (*Sapindus acuminatus*) is often seen in this region, where it becomes a handsome tree. It is more commonly known in the south as "Wild China," from the resemblance of its unripe fruit to that of the China tree, *Melia Azedarach*. *Sapindus* seems to have overlooked the fact that high botanical authority asserts that the common petiole of its compound leaf is never winged; and it persists in making its common petiole strongly margined or winged between the leaflets, at least in young trees, as specimens collected in Kansas and in Texas show. The Mexican Buckeye (*Ungnadia speciosa*) is very abundant on rocky banks and bluffs throughout our range. It grows eastward as far as Harris County, and extends far westward. Commonly a small shrub, it sometimes becomes a tree of respectable size. The largest individuals that I have seen were on the banks of La Vaca River, near Hallettsville. They were over a foot in diameter and thirty feet tall. The discovery of this species, as botanists know, marks an epoch in systematic botany. The fact of its being really a pinnately leaved Buckeye gave us *Sapindaceæ* in its present form. The rose-colored flowers are large and handsome. Each cell of its triangular fruit contains a shining dark brown, small roundish seed, closely resembling a small Buckeye-seed.

The forms of *Rhus copallina*, known as variety *lanceolata* and variety *leucantha*, are very common west of the ninety-seventh meridian. *Toxicodendron* is nearly everywhere. This species, as now defined, is in a sadder condition than even *Celtis*. It is often seen climbing seventy-five to one hundred feet high, throwing out strong horizontal branches sometimes ten feet long. It is sometimes a weak, straggling, nearly erect shrub; a low form, not more than a foot or two tall, covers hundreds of acres of the prairies of western Kansas. The western form of *R. Canadensis* is also common in rocky places. *R. virens*, with handsome evergreen leaves, is found along Colorado River and on the mountains near Llano. Its rather large white flowers appear in September, and are succeeded by bright red fruit.

At Marble Falls I met for the first time in Texas *Solanum heterodoxum*. It closely simulates *S. rostratum*, having the same watermelon-like leaves; but they are more viscid and the plant is taller and slimmer, and has bright blue flowers. *S. elæagnifolium*, *S. Torreyi*, *S. nigrum* and *S. triquetrum* are common. The last-named species is slender-stemmed and clambers over rocks and bushes. Its specific name alludes to its somewhat triangular stems.

Granite Mountain gave me my first view of the handsome fern, *Pellæa ternata*. *P. flexuosa* is very abundant along the rocky bluffs of Colorado River, and both species, with other ferns, grow on Sand Stone Mountain, near Llano. Around the mountain and everywhere in sandy places the eastern *Zornia tetraphylla* grows like a weed. It is here slighter and more erect than it is in the east. *Philibertia undulata* is

rarely found near Llano, and also *Desmodium Wrightii*, remarkable for being unifoliate.

Galactia heterophylla grows abundantly in the streets of Llano. This species was first discovered by Lindheimer somewhere along Llano River. It is, so far as known, a strictly Texan species, and has been in only two or three other stations in that state. It is noted for sometimes making itself an extra pair of leaflets, thus becoming partially five-foliate. The peculiar *Talinum lineare*, handsome *Oxalis vespertilionis*, one or two species of *Menodora*, *Cassia Lindheimeri*, *C. Pumilio* and the black-eyed form of *Enothea serratula* begin to appear near the Colorado River in Burnet County.

While at Llano I set out on a search for *Mollugo cerviana*. This rare and little-known plant was discovered by Dr. Palmer about twelve years ago, for the first time in Texas, near Bluffton, on Colorado River. That station is about thirty miles from Llano. My labor was rewarded by finding a single specimen. Two or three days later I found another individual, and almost despaired of finding more. But I found it subsequently in abundance in another locality. It delights in fine granitic sands, where little else will grow. This species has nearly the flowers of *M. occidentalis*, from which its narrowly linear glaucous leaves will readily distinguish it. These stations in Llano County are the only known Texas stations for this plant. It has, however, been collected in New Mexico and in Arizona. Collectors will doubtless find the species abundant, as I did, along the left bank of Pecan Creek, a little way above the highway bridge, and a mile or so west of North Llano. Little *Dichondra repens* is abundant in Texas wherever I have been. It is called a coast plant. It is found along the coast, but more abundantly away from it. I first met it at Arkadelphia, Arkansas. *Cissus stans*, which, however, seldom stands, and often climbs by tendrils thirty to forty feet high, with *C. incisa*, and *C. Ampelopsis* are found within the range of these observations. The southern Dewberry (*Rubus trivialis*) is also here and westward to the Rio Grande. Its stems are sometimes twenty feet long.

Lampasas, Texas.

E. N. Plank.

Mid-October in West Virginia.

THE Sour Gum (*Nyssa aquatica*) is, perhaps, the most beautiful of trees in mid-October here, yet its glory is fleeting. The earliest of trees to don its garment of brightness, it is the first to lose it, and now stands naked and forlorn, while its less brilliant neighbors, the Oaks, have scarcely lost a leaf. Twin Gum-trees, standing six feet apart on rising ground in the midst of the grove at Rose Brake, made a splendid picture for a few bright sunny days of the second week in October, all the more noticeable from the scarcity of brilliant coloring in the warm dry weather that still prevails. Now the trees are stripped and the ground beneath them glows with scarlet, fast withering to brown. These twin trees are unusually high-colored in October, the leaves turning a uniform bright red. Other Gum-trees in this grove never take on such deep tints, but are, perhaps, even more beautiful, because more varied, with red, orange, pink and green, as the sunlight blends their colors into indescribably lovely effects. Few trees possess so much individuality as these isolated specimens of *Nyssa aquatica*, with their varnished leaves, irregular forms and gnarled and crooked branches. The effect of their fantastic outlines is far more pleasing than the most formal symmetry. To no other tree does the word picturesque more appropriately apply. The individual leaves of the Gum-trees hereabout are almost always marred by the singular little larvæ that prey upon them. Sitting under the trees in late September, I used to wonder at the curious oblong "seeds," as I supposed them to be, that fell whenever a light breeze shook their foliage. Once, to my horror, I found one of the "seeds" endowed with voluntary motion and slowly and awkwardly endeavoring, by a series of galvanic jerks and somersaults, to explore the shawl upon which I sat. A little dark head emerged, and tiny feelers laid hold upon the woolly-surface shawl, and then I cut short the enterprise by taking up the explorer, bed and all, to examine. There it was, snugly tucked between two leaf-blankets, a worm or larva about one-third as long as my little finger-nail. It had preyed upon the leaf of the Gum-tree, and, not content with board, exacted bed and shelter as well from its unwilling landlord. Afterward I found, by holding the leaves up to the light, many an intruder between the upper and lower surfaces eating away the tissues of the leaf and never risking its own precious skin in return. All its active larva-life seems to be spent in this manner from the time it hatches from the tiny egg which the mother moth lays

between the layers of the leaf. Then, when its growth is attained, it carefully eats away an oval portion of the leaf, which encloses its small self and takes no further care. Puff comes a waft of wind and down it tumbles, to await the next chapter

here in the most favorable season; this year only one out of three planted in the spring is alive. Silver Firs suffer much, and some of them are too far gone to be saved when the skies relent. English Yews have died outright of pining for the



Fig. 90.—*Dendrobium chrysotoxum*.—See page 534.

in the story. I have counted as many as five of these oval perforations in one leaf.

Our young conifers continue to dry and brown before our eyes—a discouraging sight. Hemlocks are hard to establish

moist soil and frequent rains of their native land. It is a clear case of nostalgia. But the Deodar or Indian Cedars and our one tiny Cedar of Lebanon are as fresh as when planted in the spring, and a Japanese *Cryptomeria* has taken firm hold

of the rich soil of an old wood-pile, where it was planted, and is in flourishing health.

The Japanese *Retinisporas* are nearly all doing well, while *Kalmias* and Evergreen *Andromedas* have given up the struggle. *Euonymuses* and the Southern *Magnolia* stand the season well, and so do *Hollies* and the beautiful *Mahonias* and the choice *Osmanthus illicifolias*, one of the finest of broad-leaved evergreens.

In the deciduous shrubberies perhaps the most striking plant at this season of the year is *Callicarpa purpurea*. Its foliage is still green and its many clusters of small berries, which are a very unusual shade of pinkish purple, with metallic lustre, are exceedingly odd and pretty. These berries do not lose their brilliancy until late in the winter season, and I do not think they are often eaten by birds.

Yuccas are proving fine plants for a dry hill-side. They are unaffected by drought and are fresh and green at all times. We prefer to plant them in groups away from other shrubs. A few that are allowed to cluster around a large *Arundo donax* form a very attractive group.

Rose Brake, W. Va.

Danske Dandridge.

Plant Notes.

Dendrobium chrysotoxum.

DENDROBIUMS with golden-yellow flowers are always admired, especially in this group, when the flowers are borne in clusters. The subject of the illustration (p. 533) is in the collection of E. V. R. Thayer, Esq., of Lancaster, Massachusetts, and is one of the largest and best examples of the plant in this country. It carried twenty-four handsome spikes, crowded with blossoms, which remained in full beauty for four weeks. Its flowers appear during the early spring months, and, consequently, make a most useful plant for exhibiting. The glowing yellow color of its blossoms makes a delightful effect when arranged with graceful Palms and other plants with ornamental foliage.

Baskets or pots will suit the cultural requirements of this plant, although baskets are preferable, since an abundance of air is essential during its period of growth, enabling the compost to dry out more quickly, and, therefore, be less liable to become stagnant. Good fibrous peat, with very little sphagnum and free drainage, is the best compost. During active growth it enjoys a temperature of sixty to sixty-five degrees. A few degrees higher with sun heat will prove very beneficial.

New York.

A. Dimmock.

New or Little-known Plants.

Halesia tetraptera Meehani.

THIS seedling form of a well-known plant is figured on page 535 of the present issue, as it is not only interesting as showing a possible range of seminal variation, but of considerable value as a garden-plant. Its history is best told by Mr. Meehan himself, who has communicated to us the following information:

"Formerly we had only two trees of *Halesia tetraptera* from which we collected seeds for our nursery work, one in Germantown, on the Upsala estate, and one in Laurel Hill Cemetery. Our own history credits the seed from which the variety was raised to the Germantown plant, though I am willing to admit that it may have been collected in Laurel Hill Cemetery. In any case, however, there is not the slightest possibility of any hybridizing with *Halesia diptera*, the only specimen of which in this region was the small plant in Bartram's gardens, ten miles away.

"In passing the seed-beds one day I thought I noticed an Apple-tree growing with the *Halesias*. This attracted my attention to this curious plant, which was taken up and preserved. The flowers are no less interesting than the foliage and habit, as there is no trace of the narrow tube-like base peculiar to the corollas of *Halesia tetraptera*; the corolla is completely saucer-shaped, and Professor Gray, after examining a flowering branch, remarked that

if it had been found wild one might reasonably suspect a new genus.

"Though the sexual organs seem perfect and the anthers abundantly polleniferous, the plant is barren. Once I found two seed-vessels; they were very small, subtrotund, and strictly four-winged, as in those of *Halesia tetraptera*. The habit of the plant is wholly unlike its parent; the head is round and bushy, looked at from a distance precisely like an Apple-tree. At the present time the original plant is about twelve feet high and the head twelve feet across, the trunk being six feet high and fifteen inches around. My men, feeling some distinctive name for nursery purposes necessary, have distributed this plant as *Halesia Meehani*. I dislike Latin names for garden varieties, although this form might have sprung up in the forest as well as in my garden, and it seems to me that if the practice is ever justifiable it is in the present case."

Halesia tetraptera Meehani differs from the ordinary form in habit; the flowers are smaller, with a short calyx-tube and a cup-shaped corolla without the narrow base of that of the species, and are borne on pedicels which rarely exceed half an inch in length, while those of *Halesia tetraptera* are often three times that length. The leaves of the variety are thicker, distinctly rugose, pale, and on young vigorous plants often conspicuously glandular-serrate.

C. S. S.

Foreign Correspondence.

London Letter.

CYCADS.—A lecture on Cycads by Mr. Carruthers, the principal botanist of the British Museum, was a special feature in the programme of the Royal Horticultural Society last Tuesday, the other attractions being a competitive exhibition of fruits and collections of new and interesting plants. Although Mr. Carruthers talked exclusively of the botanical features of his subject, he said a great deal which would interest the cultivator. The position of Cycadaceæ in the botanical system is generally supposed to be close to Palms, but, as a matter of fact, they are very nearly related to the Coniferae, a relationship which their floral organs conclusively shows, the cones of Cycads being very similar to those of conifers structurally as well as superficially. In all other respects, however, the Cycads differ very widely from the conifers, their thick, rarely branched trunks bearing broad crowns of pinnate, sometimes spinous leaves, which are folded involutely, when young, like the leaves of a Fern, and the habit of producing their cones in the centre of the crown of leaves marking them out distinctly not only from conifers but from all other natural orders. There are some anomalous genera among the Cycads, for instance, the Australian *Bowenia*, with an irregular fleshy root-stock, from which spring elegant bipinnate leaves a yard across on stalks three or four feet high; this is a beautiful stove-plant when well grown. *Stangeria paradoxa*, the great Fern puzzle, has leaves exactly like those of a *Lomaria*, and a fleshy Turnip-like stem. It is a native of South Africa, where it was found by a German collector, and named by Kunze, *Lomaria eriopus*. But the eminent pteridologist, J. Smith, curator at Kew, doubted its being a Fern, and about forty years ago a plant at Kew flowering, it was figured under its present name in the *Botanical Magazine*, t. 5121.

The geographical distribution of the Cycadaceæ is remarkable. They are most abundant in Africa, and they occur in many parts of India, the Malay regions, Australia, Central America, Florida, the West Indies, China and Japan. The tallest are the *Cycases*, stems of which have been seen forty feet high, and the smallest is the little Floridan *Zamia pygmæa*, or *integrifolia*, as it is sometimes called. In the geological history of plants Cycads appear to have occupied a prominent position among the very first of the dryland vegetation—that is, of the Devonian or Mesozoic Age. They then appear to have been world-

wide in their distribution, representatives of them having been found as far north as Greenland. They are said to be the remains of an otherwise extinct vegetation, and, as Dr. Masters remarked in the discussion, the existence of living representatives of Cycadaceæ is quite as startling a fact in botany as living examples of *Ichthyosaurus* and *Megatherium* would be in zoölogy. *Cycas* is found in the East Indies and Madagascar, *Encephalartos* and *Stangeria* in Africa, *Bowenia* and *Macrozamia* in Australia, *Zamia*, *Ceratozamia*, *Dioon*, and *Microcycas* in America

AND FOREST to the merits of some of the Cycads as garden-plants. They are more in favor in Belgium, France and Russia than in England. I know no more noble plants either at Kew or elsewhere than the grand specimens of *Encephalartos*, *Cycas*, *Macrozamia*, *Dioon* and *Ceratozamia*, which are to be seen in the few gardens where Cycads are in favor. A remarkable character in Cycads is that of exceptional vitality in their stems. The plants may be cut down and their heads put in as cuttings with safety, and although they do not branch, as a rule, yet if they



Fig. 91.—*Halesia tetraptera* Mehani.—See page 534.

and the West Indies. Mr. Carruthers stated that *Bowenia* in Australia and *Stangeria* in Africa are totally unlike any other vegetable forms among which they grow; there is no plant known either in botany or geology which links them with the chain of vegetation as at present known. He asked the pertinent question, "Are these two plants the remains of an otherwise extinct race, or are they newly evolved?" The exceptional interest of Cycads is not the only claim they possess to the notice of horticulturists. I have lately drawn the attention of the readers of GARDEN

lose their central bud they will sometimes develop one or several buds lower down the stem. I have seen a *Cycas* stem, the top of which rotted, afterward produce three lateral buds, which finally developed and grew into three separate plants. Imported stems have been known to remain quite dormant for more than three years, and then push into vigorous growth and flourish.

NEW VARIETIES OF *CORDYLINA AUSTRALIS*.—This is one of the most variable of New Zealand plants, and there are many forms of it already in cultivation here. Mr. Elliott,

of Christchurch, Hampshire, recently exhibited some new varieties which promise to eclipse most of the older kinds as decorative plants. Among them are *Aureo-striata*, narrow and rather short in leaf, with lines of deep yellow on a green ground, and more or less spirally twisted; *Nobilis* has distinct parallel lines of brown not unlike the older *lineata*, but the leaves are shorter and broader; *Compacta nana* accords with its name, and is a pretty little plant, likely to become a favorite for table decoration; *Elegans* has linear arching leaves, and *Lusiformis* is another elegant variety; *Rubra* has rich bronzy brown foliage and is a handsome plant. It was awarded a first-class certificate by the Royal Horticultural Society. We believe these are all selections from seedlings raised in New Zealand.

NEW CHRYSANTHEMUMS.—There were four *Chrysanthemums* selected for certificates from the large number of new seedlings shown this week: Mrs. C. Myers (Owen), a broad-petaled, large-flowered, white Japanese; Baron Hirsch (Owen), a reddish bronze flower with golden reverse, of the incurved section, with broad substantial petals. It is a large and promising variety for the exhibition-table; William Seward (Seward), a Japanese variety, with the color of *Cullingfordii*—that is, brownish crimson, with buff reverse. The flower is large and of good form. It was generally voted to be one of the best of the newer seedlings. *Beauty of Exmouth* (Godfrey), a beautiful white Japanese variety, said to be the result of a cross between *Avalanche* and *Stanstead Surprise*. The flowers are very large, globular, the petals broad and curled and pure ivory-white. The plant grows about five feet high, and the flowers are developed from October to January.

NEW ZONAL PELARGONIUMS.—Mr. Cannell has produced several varieties of merit this year. Among those exhibited for certificates this week were *Madame Bondeville*, of French origin, remarkable for the size of its flower-heads and for the very pleasing color of its flowers, soft salmon, with a distinct marginal line of rosy pink. *Raspail Improved* is a genuine improvement on the original; it is larger in truss and much larger in flower than the popular market variety *Raspail*. The flowers are rich scarlet, and some of them measure over two inches across. *Double New Life* is a remarkable sport of the third generation from *Vesuvius*, obtained twenty-five years ago. Out of *Vesuvius* came *Wonderful*, which yielded *New Life*, a single-flowered variety with white flakes or stripes on the petals. From this has sprung *Double New Life*. It is only semi-double, but its looseness and the white flakes on the petals make it attractive. These received certificates.

MELON BEAUTY OF SYON is a new seedling which received a first-class certificate this week from the Royal Horticultural Society. The gardener at Syon, Mr. G. Wythes, has taken special interest in the culture and improvement of the Melon, and he is to be congratulated on having raised one which promises to become a general favorite. It was raised from *Hero of Lockinge* and another, and has round, medium-sized, yellow-netted fruit, smooth, with scarlet flesh, melting, juicy and of first-rate flavor. The members of the Fruit Committee were unanimous in its praise. It will, no doubt, be better earlier in the season than in the middle of October.

London.

W. Watson.

Cultural Department.

Plants for Summer Decoration.

MUCH has been said against the practice of bedding out, but, after all, when the proper plants are used we can secure effects in this way which are not obtainable in any other, and as stock-plants are now in their winter quarters or protected and made secure, it is worth while to name some of the plants which have proved most useful during the past year, so that they can be propagated during the winter in sufficient numbers for our purposes next season. It is well to secure a considerable variety, if only to break the monotony, of the too prevalent *Coleus* and *Geraniums*.

Among the species most worthy of cultivation is *Acalypha*

tricolor, a plant of strong growth with ovate-acuminate leaves, coppery green and beautifully blotched and colored with red and crimson. Our hot summers suit it admirably, and it should be planted in the very warmest spot possible, and in the full sunshine. It is easily propagated by cuttings, but where the stock is limited the old plants must be preserved for use. It does not lift well, and a little extra attention in this particular will be well repaid. It is a stove-plant, and, therefore, must not be subjected to a low temperature when taken from the ground. The young succulent growth of the tips of the branches will answer for cuttings, and large plants, cut back root and branch, and laid on a bench where there is gentle bottom-heat will soon break, and as fresh growth and roots are made the plants should be potted and kept in a warm house, and abundant cuttings will be afforded during the early season of the year.

Another useful plant is the variegated form of *Sanchezia nobilis*. It is large, with leaves of intense green, their mid-ribs and veins heavily margined with gold and yellow, so that the entire plants can well vie with the popular *Croton* when used in summer decoration. It grows more freely, however, and is more easily propagated than *Crotons*, and stock can be raised in a short time. *Crotons* themselves have formed such striking features in the public parks of late that their use in private grounds is sure to become extensive. In diversity of color and form of foliage they are most attractive. They, too, delight in full sunshine and rich soil, and copious supplies of water during hot weather. Large plants are most effective, but they require time to attain size. Smaller specimens will be satisfactory, but instead of crowding them it is better to use some dwarf plants to cover the surface of the bed, so that the individual beauty of the *Crotons* can have full opportunity to display itself.

Very graceful and charming for summer use is *Phyllanthus Roseo-pictus*. The variegation is exceedingly rich, no two leaves showing precisely the same markings or tints. Many of the leaves are bright crimson, which is also the color of the stem during the early stages of its growth. Some are a light cream color tinted with a delicate blush. Others, again, have a dark bronzy hue shaded with crimson, while some are dark green with blotches and spots of rose. Others are tricolored, being white with different shades of rose and green. A plant six or eight feet high and furnished to the ground, is a magnificent sight. Smaller plants can be used as centres of beds with an undergrowth of *Altenanthera aurea*, which makes a pleasing combination. When planted out, small plants grow rapidly. They are multiplied by cuttings from the shoots and roots, the latter being preferable.

Grevillea robusta makes a beautiful specimen plant on account of its Fern-like foliage. In a group also it is well placed in the centre of a bed. Plants raised from seed early in spring will usually be large enough to plant out the same year, but fall-sown seedlings are preferable for specimens. Older and larger plants are very ornamental where space can be afforded for wintering them, but as they grow rapidly and attain a height of from eight to ten feet the second year, it is not necessary to winter very large plants. The same is true of *Eucalyptus globulus*, which is most effective either as a specimen or in a clump, since its glaucous blue foliage is very striking among deeper hues.

Musa Ensete and *M. Martini* are both desirable the first year from seed which is sown early in spring. Their foliage is short and sturdy, and is not so liable to get broken by heavy storms as is that of older plants. The best plants I have seen grown were set in heavy soil. *Papyrus Antiquorum*, whether treated as an aquatic or as a border plant, makes magnificent groups, its tufted blooms rising to a height of eight feet. It delights in a rich moist soil, and endures the weather better in a bed or border than when submerged in water. Planted in a mass with a border of *Caladium giganteum* the effect of the light and dark foliage is very striking. Seeds sown very early in the season and kept on growing will produce seedlings suitable for planting out the same year.

Very desirable, although too rarely seen, is *Cassia corymbosa*. Its beautiful yellow flowers are produced in abundance all the season until frost. As soon as the foliage dies it can be pruned back severely, when plants may be lifted and kept in a cold place through the winter. It can be easily raised from seed, however, although it does not flower, as a rule, until the second season. The Coral Tree (*Erythrina*) is a useful companion to the *Cassia*, and succeeds well under the same treatment. *E. Hendersoni*, which bears abundant bright scarlet flowers, is readily raised from seed, and one of the very best.

The Rubber Tree, *Ficus elastica*, and its variegated form, must not be omitted from this list of plants for summer deco-

ration on account of its dark green glossy foliage and bright crimson sheaths, which are much brighter than when grown within doors. It endures the weather well and can be lifted without injury. Now is a good time for propagating it. The main shoots should be girdled so as to check the flow of sap and form a callus. If moss is tied around and kept moist, roots will put forth, and with a little attention a good plant will be formed before it is severed from the stock-plant. Shoots may also be taken off, and leaves with eyes that are started, placed in a propagating-frame with bottom heat, will make plants for next season.

New Zealand Flax (*Phormium tenax*) and its variegated variety are very serviceable in exposed places. Their long sword-like leaves are quite distinct when associated with other sub-tropical plants, and are never beaten or broken by heavy storms or high winds. This is also a useful plant for the greenhouse or living-room. Solanums and Wigandias are rapid-growing and ornamental, but they need to be set in a sheltered place or they are soon damaged, since their growth is succulent. No decorative plant has made more marked improvement than the Cannas. The variety, Madame Crozy, with its dazzling brilliancy, is almost painful in a mass, but where planted in small quantities and relieved by the bronzy green foliage of other varieties, it is magnificent. A single plant in a mixed border is also very effective, and so are specimens in greenhouses or conservatories. It flowers perpetually, and can be had in bloom the whole year round. Other equally good and distinct varieties have made their appearance this season and promise to be valuable. Among them I should select Alphonse Bouvier, a strong-growing sort, three and a half feet high, with deep green foliage and tall spikes of rich scarlet-vermilion flowers, which are very large and distinct. J. D. Cabos is another striking novelty, which grows strongly to the height of four feet and has rich purplish foliage. Its flowers are large and round, of a rich apricot color, with deeper shadings. Cannas are readily raised from seed, which will flower the first season, and a large percentage of good flowers are produced from the seed of Madame Crozy.

Cordyline indivisa makes a very graceful and serviceable specimen, and, when small, is an admirable centre for a vase. Its leaves are long, tapering, light green, and not readily broken by high winds even in exposed positions. Plants are quickly procured from seed, and soon grow to specimen size, as they make rapid growth when planted out during the summer. They can be easily lifted, too, and kept in the greenhouse during the winter. They do not need pots in proportion to their size, as many other plants do. When lifting most plants in fall it is desirable to put them into as small pots or tubs as will conveniently contain the roots without bruising them. The preservation of a good ball of roots, however, is necessary for all those that are annually planted out and lifted.

Dongan Hills, N. Y.

Wm. Tricker.

Foliage-plants.

IN the case of warm-house plants at this season more attention is needed to secure the proper conditions of temperature and moisture than during the summer; as the days shorten the growth of such plants will be slower, and they are thus less able to withstand extremes of treatment. Comparatively little potting will be needed among this class of plants during the next two or three months, except it may be in the case of some small specimens that would be likely to suffer before the time of the general repotting in the spring. Even in such instances it is advisable to give only a small shift, for overpotting is doubly dangerous to tender-rooted subjects during the early part of the winter. Watering and syringing should be done early in the day, for too much moisture on the foliage will soon injure it, though when strong heat is applied after the nights become colder, it is a good practice to damp down the walks and under the benches in the afternoon, to prevent the atmosphere from becoming too dry.

The attacks of insects must be watched for with strict attention also during the winter months, for with the partial cessation of syringing such pests as red spiders and thrips are very likely to appear on *Dracænas*, *Cordylines*, *Crotons* and *Diefenbachias*, and, if unchecked, will soon ruin the foliage. Tobacco-water is the most effective remedy for these troubles, and in a conservatory is less objectionable than fumigating, besides being more effective, with red spiders at least. If this pest becomes plentiful on any particular plant, it may be removed by giving a dip in tobacco-water to which has been added some sulphur, the strength of the wash being proportioned to the kind of plant, for the tobacco-water will injure tender foliage when used too strong.

Several of the prepared insecticides are also useful preparations for this purpose, especially for small establishments where the limited quantity of such mixtures required makes their cost appear less formidable. But if any considerable quantity of insecticide is needed it is more economical to use the home-made remedies, and among these the tobacco-water and solution of whale-oil soap are among the most satisfactory. For some extreme cases the kerosene emulsion is very effective, but this must always be used with judgment, or the result will be disastrous.

The propagation of various foliage-plants can be carried on during the winter, provided sufficient heat can be had for the purpose. Among these *Crotons* and *Ficus* may be included, the first-named rooting readily at any time in a warm house. With generous treatment there will be nice-sized plants for bedding out in June. There is also little difficulty in rooting *Ficus* cuttings, especially about January. The safest method is that of topping, by means of an incision in a shoot, some three or four leaves from the tip, and binding some damp moss around the cut. Under favorable conditions these tops will send out roots in two or three weeks, and can then be removed from the parent plant and potted. Such cuttings naturally make more shapely plants than those struck from a single eye, and the tops can be rooted at any season of the year without difficulty.

Some of the slender *Aralias*, like *A. Veitchii*, *A. elegantissima*, and *A. leptophylla*, can also be worked during the winter and spring, using for a stock either *A. reticulata* or *A. Guilfoylei*, as the first-named species are very slow rooting from cuttings, and will grow away more freely when grafted. The stocks for this purpose may be supplied either from root or top cuttings, cleft grafting, if neatly done, being the most satisfactory method for this operation.

The tops of *Cordylines* and *Dracænas* may also be rooted in the manner recommended for *Ficus*, making by far the finest specimens, as they have large leaves, extending to the pot, if properly grown, beside showing more color than those that have been potted on from small plants.

W. H. Taplin.

Holmesburg, Pa.

Wintering Strawberry-beds.

THE proper care of Strawberry-plants during the cold weather is an important item in the cultivation of this fruit. They may live through a very low temperature, and yet suffer seriously in vigor and usefulness; a smaller, inferior and later crop is sure to follow needless exposure. The extent of this damage depends, of course, on the severity of the winter and the degree of exposure. In the northern states a temperature not much below the average is liable to make a clean sweep by killing the plants outright. Even in this latitude, and in ordinary winters, I find the loss to average one-fourth, and wherever the thermometer is liable to drop ten degrees below freezing winter protection will pay well. Numerous substances may be used to protect the plants; some better than others; almost any better than none. At the south we never think of anything but pine-needles, or pine-straw, as we call it. Not only does the resinous nature of the pine-straw tend to repel insects which might possibly take refuge under the covering in winter, but it is an excellent non-conductor. It is also, from mechanical reasons, an ideal protector. Its shape and size render it easy to apply evenly and rapidly. The needles are so small that even the hardest wind is apt to pass through the mass without any serious displacement, while the same openness allows the passage of sufficient air to prevent smothering even where the cover is deeper than it should be. I have had plants to survive an accidental covering of three feet, and that, too, where the pile of straw lay for four months. I need hardly say that such a deep covering would be neither practicable nor safe, one inch of this kind of covering being sufficient even in a cold climate.

Pine-straw not to be had, my next choice should be corn-stalks, laid uncut and evenly over the bed in the direction the rows run. As they lie much more open than straw, a depth of one foot would be about right. Where neither of the above are procurable, recourse is generally had to hay or wheat or oat straw. The main objection to these is that they are all easily blown off. Some seek to prevent this by chopping it very short, which, according to my experience, is no remedy at all. The separate particles are still so much larger in proportion to their weight than pine-needles that they are apt to take wings on gusty days. I should much prefer to apply the straw whole, and anchor it by means of poles or some such weights laid on top. Even earth might be used to hold the straw, provided a little care was taken in its application and removal. It need not be either deep or continuous, but

only in small piles as far apart as the length of the straw will admit.

Coarse stable-manure possesses a natural warmth beyond other substances, besides being an excellent fertilizer. Yet it is more apt to smother plants than either of the others, if carelessly applied. But even when very fine, a uniform application half an inch deep would be safe, and can be left on as a mulch through bearing time, the weeds being kept down by hand. When an inch of pine-needles or grain-straw was used, quite two-thirds should be removed from over the plants in early spring and left between the rows. Should the alleys between the rows be too narrow the surplus straw must be taken off the bed and piled elsewhere.

Ordinary forest-leaves are often successfully used, weighted down like grain-straw. Even chips or sawdust are better than nothing, provided they are not suffered to accumulate on the bed to the detriment of the soil. In a moderate climate, say where the mercury keeps above ten degrees, Fahrenheit, evergreen bushes or boughs would be equal, or possibly superior, to pine-straw.

In short, there are so many things available for this purpose that no gardener, unless he is woefully lacking in energy and ingenuity, need fail to find some of them. Anything that protects without smothering will answer. A safe rule is to apply nothing too deep to prevent a slight freezing of the ground in severest weather. The proper time to apply is as soon as the ground freezes an inch deep. Rake off the surplus before it is time for the plants to start into growth. Here I find that from December 1st to March 10th to be the best average dates to cover and uncover, respectively.

There is another very good use to which this straw, etc., may be put. As it lies between the rows after being drawn off the plants in spring, it can easily and quickly be drawn back on them to save the blooms from frost. In case of protracted cold, it can safely be allowed to remain for three or four days without damage to the plants. Its removal is also a small matter. Even where cold snaps should occur repeatedly the raking on and off the straw would consume only a few minutes each time, and be many times repaid by a crop of fine early berries, which would otherwise be destroyed.

Kittrell, N. C.

O. W. Blacknall.

Correspondence.

Forests in California.

To the Editor of GARDEN AND FOREST :

Sir,—The subject of the preservation of Californian forests is seldom discussed without some reference being made to the injury wrought by roving bands of sheep, and by the fires which follow in their wake. Throughout the high Sierra sheep are pastured only in summer, and find winter feed in the foot-hills and valleys. In the high mountains the land belongs to the Government for the most part, and the sheep are nomadic. Young trees are killed by browsing, while, by accident or design, fires start which sweep over vast areas, killing the young conifers and much large timber as well.

I only allude to the connection between sheep and forestry in the Sierras to emphasize a curious paradox in another section. Lying from the sea-coast back for fifty to one hundred miles, and reaching in California from San Bernardino on the south to the Oregon boundary and continuing through Oregon and Washington, the Coast-range is a vast mountain system enclosing numerous valleys. In northern California a belt of coniferous trees, mostly Redwood, lies next to the sea-coast, and in Oregon and Washington the Coast-range is covered with Spruce and Fir. Outside of the Redwood region and the groves of Yellow Pine, of comparatively small area, the Coast-range in California is a region of Oaks and other deciduous trees, with large tracts of grassy slopes, and equally large areas of low, dense brush, locally called Chemical and Chaparral.

This whole mountainous section is devoted to sheep. The land, or enough to control it, is owned by the sheep-owners in tracts large enough to carry flocks of from 1,000 to 20,000 head, which range over the same country throughout the year. Now, it is a matter of common remark throughout this section that the brush is encroaching rapidly upon the open slopes or grazing-land. That it should be so seems strange, flatly contradicting, as it does, our preconceived ideas of what the effect should be. It would seem that in the ages past the timber would have covered all suitable areas. To understand why we have this result we must study conditions. Before the white occupation all of these open slopes were covered in summer with a luxuriant growth of grass. Wild

Oats grew waist-high, and other grasses in proportion. Fires were started by natural causes, or by the Indians, who fired the grass to drive game from cover or to open up the brush for future hunting; and these periodical burnings had such a great heat as to kill trees or shrubs of most sorts in the grasslands and to keep down the hardiest sorts.

When these mountains became private property and sheep were run on them, the luxuriant growth was kept down. Many natural grasses are killed out and replaced by foreign grasses. I have seen the entire range of grass change twice. Sheep-trails and grass eaten to the ground stop the spread of fires, and then, too, there is not such a mass of tinder to make so intense a heat. Grass is the sheepman's capital, and he carefully guards against brush or grass fires. The sheep can by browsing do little injury to the Oaks, and will scarcely touch the Laurel, Manzanita or Madroña.

As a result, we not only find the brush and woodland encroaching on the pasture, but the dense thickets of brush are becoming woodland by shading out the weaker growth.

Ukiah, Cal.

Carl Purdy.

Late Flowering of Jackman's Clematis.

To the Editor of GARDEN AND FOREST :

Sir,—Passing along a street in Marblehead, Massachusetts, I was surprised to see this morning (October 29th) a splendid specimen plant of Clematis Jackmani that had been trained above the second story of a house, and which presented a mass of most gorgeous bloom on all its terminal shoots. Without doubt, there were from twenty-five to thirty perfect flowers, and of more than ordinary size individually. That this gorgeous effect would be possible at this date would ordinarily seem quite incredible, but is illustrative of the unusually late autumn which we are experiencing.

Reading, Mass.

J. Woodward Manning.

Periodical Literature.

Citing as its authority Mr. C. W. Hayes, who not long ago explored the Yukon District of Alaska, the *Popular Science Monthly* for November says that in the interior plateau of the Cordilleran and St. Elias regions "surface degradation is greatly retarded by the luxuriant growth of moss, which covers practically the entire surface of the country. The annual precipitation is largely confined to the winter months, and the water from the melting snow is held by the sponge-like moss, which remains saturated throughout the short but hot and dry summer. Thus, with a rainfall which in lower latitudes would condition an arid region, a large part of the surface is swampy, quite irrespective of slope—that is, wherever the material composing it is sufficiently compact to become impervious to water on freezing. On account of this slow and imperfect surface drainage, the slopes are not cut into the ravines and arroyos so characteristic of arid regions."

Last year Mr. Frederick Le Roy Sargent published a note in the *Bulletin of the Torrey Botanical Club* with regard to a Linden which did its best to profit by an injury to its trunk by throwing out adventitious roots to feed upon the decaying wood within. This has called forth accounts of similar instances of abnormal growth from several other observers, and Mr. Sargent now publishes them in the *Popular Science Monthly* for November in an article called "Economical Trees," in which the foregoing and a number of new examples are brought together in an interesting comparison. Several good illustrations accompany the paper, the most remarkable of them showing the trunk of an old Mulberry which stands at Thomasville, Georgia. Of this Mulberry, its owner, Dr. T. S. Hopkins, writes: "I have had an intimate acquaintance with this old tree for thirty years. I do not know how old it was when I first knew it. Some fifteen years ago it was uprooted by a storm. I carefully amputated its limbs and re-erected its body. It lived and improved, and to-day furnishes as much shade as it did before its fall, and the surgical operation made necessary by it." Mr. Sargent adds that "in point of size, extent of decay and the number and thickness of its adventitious roots, it would seem to be much the most striking example of an economical tree thus far described. The trunk is now about three feet or more in diameter, and so much decayed as to leave merely a shell of no great thickness. The adventitious roots are some of them as thick as a man's arm. They all ramify through the disintegrating heart of the tree, and the longest of them appear to reach the earth. Besides saving from waste the products of decay, these roots must add considerable strength to the weakened trunk. This feature is,

perhaps, all the more significant in view of the Mulberry's near kinship with the Banyan-tree, which makes such wonderful mechanical use of aerial roots." The picture shows some of the roots of the Mulberry crossing the huge cavity in the trunk like mammoth harp-strings.

Exhibitions.

The New York Chrysanthemum Show.

THE great amphitheatre of the Madison Square Garden is a place of surprising changes, and there is no change during the year more cordially welcomed than that which converts it into a maze of Chrysanthemum blossoms. Under the auspices of the New York Florists' Club, the Madison Square Garden Company opened the usual fall exhibition on November 1st, with a schedule of prizes valued at nearly seven thousand dollars, an amount which should have brought on an interstate competition, which would be sure to prove interesting. There was no lack of material, however, though the competition was mostly confined to local growers. The broad oval was filled with masses of flowers. As one entered the Garden and passed a great mound of decorative plants, contributed by Messrs. Siebrecht & Wadley, the foreground was seen to be filled with trained plants, beyond which, surrounding a fountain with a large basin, were covered tables, on which were displayed the cut flowers for competition. The borders of the oval were banked with great numbers of plants in small pots grown to single stems, which seem so popular among the growers. Beyond the tables a mass of Palms marked a floral booth in white, which was in striking contrast to the gay central booth of last year. The large vases of flowers, which were the striking feature of the last show, were duplicated here in great numbers, and even more bold effects were seen with enormous bowl-shaped vases, each containing twenty-five or fifty blooms. We doubt if any nobler display of the Chrysanthemum at its best has ever been made at any exhibition.

A half-dozen large Chrysanthemum-flowers in a tall vase of suitable size is such a satisfactory object that every one does not realize that a single bouncing bloom is a difficult subject to dispose of satisfactorily, owing largely to the fact that the flower has no surplus foliage as a foil. A board of Chrysanthemums is not an aesthetic object, but has certain advantages from an exhibitor's point of view. But, as the flowers have grown in size, it has been felt that an effort should be made to show them more informally and in ways which would make them more attractive, if possible, to the great flower-loving public.

The New York Florists' Club is a progressive body and deserves great credit for its bold departure in devoting a large share of the prize money to exhibits of cut flowers shown with long stems and arranged in uniform vases as supplied by the management. These vases, moulded in a handsome pattern of clear glass, were about two inches in diameter, with ample bases, and a foot high. Taking the flowers as units, the arrangement is of great merit, but such vases need space for effectiveness, and it will be necessary to devise some arrangement of the various collections of twelve, twenty-four and forty-eight, and to show the individual vases and flowers. Some simple device, like a table of medium height with terraces or steps, would possibly add very much to the individual and general effect, especially if the different collections were separated by a few small foliage-plants. The specimens were to be seen in tens of thousands, and, on the average, distinctly superior to those shown last season. Not only was the average of the flowers better as to finish and size, but they were notably, with few exceptions, of firmer substance and remained in good condition longer than before. The competition was keen in cut flowers, and all the classes were well filled.

The cup offered by the GARDEN AND FOREST Publishing Company for the best vase containing six blooms of one variety was awarded to Peter Henderson & Co. for a vase of the Golden Wedding, a variety of Japanese origin, which is the sensation of the season. The flowers are of the very largest size, yet not coarse; the form is perfect, the petals gracefully incurving somewhat irregularly. The color is a clear golden yellow. A mammoth vase furnished with fifty flowers of this noteworthy variety also gained the silver cup offered by Mrs. W. Bayard Cutting. The John Eyerman silver cup, for the best six blooms of pink, was awarded to J. Simpkins for a vase of Mermaid. The silver cup of Peter Henderson & Co., for a vase of twenty-five yellow flowers, was awarded to J. Brydon, of Yarmouthport, Massachusetts, for a fine mass of

W. H. Lincoln. The Dailedouze Brothers' prize for the best six blooms of any variety introduced in the spring of 1892 was taken by Julius Roehrs, for fine blooms of Maria Simpson, a flower in the way of Eldorado. The principal prizes for classes of cut blooms were taken by Ernest Asmus, Dailedouze Brothers, Pitcher & Manda and Julius Roehrs.

An interesting exhibit was brought out in the competition for the best twelve vases with six flowers of one variety in each vase. The group which took the prize contained Miss A. Swann, Harry May, Roslyn, Minnie Wannamaker, H. Cannell, Lillian B. Bird, Eda Prass, Colonel W. B. Spaulding, Kioto, H. E. Widener, J. H. White, Ada Spaulding, and the plants were shown by F. T. Underhill, Oyster Bay, Long Island. The prize for the best twenty-four Japanese varieties, shown on boards, was awarded to Ernest Asmus with the varieties Edward Hatch, Dr. Callendreau, H. E. Widener, Miss Bertha Robinson, W. H. Lincoln, Exquisite, Mrs. E. D. Adams, Mrs. J. Thomas, Viviani Morel, Ivory, Volcano, Mrs. Governor Fifer, Mrs. Irving Clarke, Golden Gate, Domination, Mermaid, Jessica, Waban, Cochinella, Edward Hitzeroth, Mrs. J. N. Gerard, Ed. Molyneux, Minnie Wannamaker, Hicks Arnold.

A vase given by J. H. Taylor was awarded to Dailedouze Brothers for the best flower in the show.

Plants in trained specimens, standard plants, and plants grown to single blooms, were shown in large numbers, but were without special feature. For these the principal prizes were taken by Pitcher & Manda, Julius Roehrs, Ernest Asmus, T. H. Spaulding. A special prize, a silver cup, offered by James Dean, was awarded to T. W. Hatfield, gardener to Walter Hunnewell, Esq., of Wellesley, Massachusetts, for the best plant exhibited. This was a well-grown and flowered plant of Mrs. Alpheus Hardy.

On Thursday seedlings were exhibited in great numbers; but, although the flowers averaged unusually good, there were no striking advances or departures from well-known types, and few new varieties, indeed, which a Chrysanthemum society would care to certificate as superior in any respect to those already in cultivation. As varieties multiply it becomes more and more necessary to be cautious about scattering such honors as first prizes at a great exhibition with too lavish a hand. The first prize for the best pink seedling, for example, might mean very little if there were only two or three flowers of that color in the competition, and it means still less if the flower so decorated is not a true pink after all. Among the white varieties, W. G. Newett; among the yellows, Mrs. F. L. Ames, and among the pinks, Wm. Plumb, attracted notice. The principal prizes in this class went to F. S. Waby, Pitcher & Manda, E. G. Hill & Co., F. D. Underhill and J. N. May.

On the last days of the exhibition, the large vases and baskets in which flowers with long stems were arranged with other foliage, were striking features. These large vases, set on draped pillars or pedestals, often contained a hundred flowers, and many of them were very effective. In some, however, the mistake was made of mingling with the bold flowers Adiantums and other plants of delicate foliage. Several dining-tables were also shown dressed with Chrysanthemums and various kinds of foliage, but in almost every case the decorations were too profuse and looked burdensome.

The cut Roses were unusually good, and if one can judge by the interest manifested by the visitors, the Rose held its own with the Chrysanthemum. The comparatively new Rose, Madame Testout, was shown in admirable form by Ernest Asmus. The flower is a clear pink, which lights up beautifully, and it has an air of refinement and distinction which is quite captivating. The Kaiserin Augusta Victoria is a new white Rose with exquisite Tea fragrance, and is looked upon as a strong competitor of The Bride. Another new Rose shown was Bridesmaid, a sport from Catherine Mermet, and another still was John Burton's American Belle, a sport from American Beauty and a little lighter in color. Mrs. William C. Whitney is a seedling pink Rose, with long well-formed buds, raised by Mr. John N. May. Of the older Roses Meteor was conspicuous, its deep color being rare at this season, and this, with its long stems and good foliage, makes it very desirable. Madame Cusin was abundant, and is popular on account of its good color and keeping quality. Madame Watteville and the old Perle, still unexcelled among the yellows, were also noteworthy where all were good. The chief Rose prizes were won by F. R. Pierson, of Tarrytown; Ernest Asmus, J. H. Taylor and John N. May.

Notice of the Carnations, Cannas and other plants must be deferred, but it may be said that the flowers throughout were worthy of the exhibition, which seems to have become one of the established institutions of the city under the happy co-operation of the Florists' Club and the Madison Square Garden Company.

Notes.

In the Palace Gardens at Ely, according to the *Gardeners' Chronicle*, is a Plane Tree which measures nineteen feet around the stem at its smallest part, six feet from the ground, and from the stem to the branches, on either side, fifty feet. It is about one hundred feet high.

Among the German exhibits at the Chicago Fair will be a mediæval village, to be built on the Midway Plaisance under the auspices of the Deutsche Bank of Berlin, which will show the rural architecture, the home life of the peasants, and the household industries of the selected period.

We have received from Mrs. Dandridge leaves and fruit of the plant which she had purchased for *Elæagnus longipes*. It is a Japanese species, which is called in the Arnold Arboretum *E. umbellata*. The fruit has somewhat the flavor of *E. longipes*, but it is much smaller and matures much later.

Celastrus articulata, the Japanese relative of our native Bitter Sweet, *C. scandens*, is unusually beautiful this year, perhaps owing to the lateness of the season. Our plant has the advantage in habit, since the flowers appear at the end of the young branches, instead of being sessile in umbels at the axils of the leaves, as in *C. articulata*, so that the fruit is hidden by the foliage until it falls. The fruit of the native plant, too, is a trifle larger, but just now the color of the Japanese species is brighter than that of the other.

Complaints are heard from all parts of the north Atlantic states about the parching drought. In many cases the springs and wells have dried up, and it is hardly possible that the ground can be well supplied with water before freezing weather arrives. Under these circumstances it will be a trying winter for trees, and especially for evergreens. A casing of frozen earth is impervious to rain, and the water quickly runs off to the streams, leaving the earth about the roots of the trees dry all winter long. As the moisture evaporates from the leaves it cannot be supplied by the roots as it can when the ground is damp, and it is probable that many trees will therefore perish.

The American Consul-General at St. Petersburg, writing in the *North American Review* for November, says that at the Chicago Fair the Russian Ministry of Public Domains will exhibit a complete collection of the agricultural products of Russia, including all sorts of fruit, vegetables, cereals, wood, and the products of the stone and metal mills, as well as of the fisheries belonging to the Government. It is intended to make the agricultural branch of the Russian section as complete as possible, that planters and dealers in agricultural products and implements may have an opportunity to judge from personal observation of the state of Russian farming, especially as to such articles as are exported by both countries. The Department of Appanage will exhibit wines in great variety, from the immense vineyards of the Emperor, situated in the Caucasus, Crimea and Bessarabia.

The stress which is laid in France upon the proper placing of outdoor monuments is shown by the fact that before the monument to the painter Millet, recently unveiled at Cherbourg, was begun the site for it was carefully selected by Chapu, the sculptor charged with its making, aided by Bonnat, the famous painter. The selected spot is at the end of the public garden, in front of a group of ancient trees which cover it as with a dome of verdure, and the monument was evidently designed to fit such a site, as reproductions of it show that it is intended to be viewed only from the front and sides. It consists of a tall granite pedestal adorned with branches of Oak, which rise so as to form a sort of background for the base of the white marble portrait-bust which stands on the pedestal; and at the base of this last stands a peasant-woman's figure, recalling those which Millet so often painted, holding up a child, who lays a Palm-branch at the foot of the bust.

On the plains of Auvergne, the altitude of which is 300 metres, and in almost all the elevated parts of southern France and well into the Pyrenees, may be found a large species of the Composite family, *Carlina acanthifolia*, a hardy and very ornamental plant with pinnatifid leaves, a little hairy on the under surface, and bordered with spiny teeth, and with violet-purple flowers which are disposed in a single head. Possessing no stem, the plant lies prone on the ground, with its leaves outspread, resembles a great Artichoke, and, according to a writer in the *Bulletin d'Arboriculture et Floriculture*, of Ghent, it might be utilized for food. Indeed, Monsieur Clos, Director of the Jardin des Plantes at Toulouse, reports, on the authority of Dalechamp, that in the sixteenth century a considerable use was made of it in the province of Dauphiné, where

it was considered superior to the artichoke. It was also valued for the table in the Pyrenees and the Lozère, where a hill-side near Mende was rented for 300 francs a year for its cultivation.

All persons interested in botanical science will be glad to learn that the herbarium of Wm. M. Canby, of Wilmington, Delaware, has been secured by the New York College of Pharmacy, and it will, therefore, be in good hands and will be kept together. The \$6,000 which was paid for it, according to published statements, will hardly cover the actual money which has been expended upon it, to say nothing of the intelligent work which Mr. Canby has given to it during thirty-four years in traveling, collecting, corresponding and arranging. The number of species in this collection is not less than 26,000, and it may reach 30,000. The number of specimens to illustrate these species amount to 150,000. Every specimen is properly mounted and arranged in genus covers. The herbarium has already aided the studies of almost every American systematist of consequence, and specimens have often been sent to European botanists for their inspection. It has, therefore, not only already been of extended use, but has had the benefit of supervision by many eminent men.

A correspondent of the *Levant Herald* writes that a formidable danger threatens the Valonia Oaks of Asiatic Turkey in the shape of swarming caterpillars, which eat off the leaves early in the spring, and therefore destroy the fruit. For many years this pest was confined to small and isolated groves, but during the last four years it has extended its ravages until it prevails among all the Valonia-groves of the plain of Scamander and neighboring localities. The injury done to the trees is serious, and the yield of acorns is reduced in quantity and shrunken in size. A few more summers of such an infliction will bring absolute death to the forests. No organized measures for the extermination of this insect have been set on foot, and energetic proprietors who attempt to rid their trees in autumn of the eggs laid by the butterflies are handicapped by the imbecile apathy of their neighbors, who consider it impious to resist what they call a visitation of Providence, and will not stir a finger to help themselves against the pest. Of course, caterpillars which breed on these infested trees spread to the trees of the man who has been at the trouble and expense of clearing away the insects, and defoliate them also. Unless the evil is not eradicated it will seriously diminish one of the staple products of Turkish soil, and the danger is sufficiently alarming to call forth state intervention. If every proprietor were compelled under penalty of a fine to cleanse his trees by the middle of December, a work which does not seem to be very difficult, the pest might be overcome. The acorn-cups of this Oak, *Quercus ægilops*, contain much tannin, and thousands of tons are annually exported from Smyrna and other ports to be used for tanning, dyeing and making ink.

In an interesting article, called "Waste Products Made Useful," published in the *North American Review* for November, Lord Playfair says: "As to perfumes, there are some which are really oils, and others extracted from flowers. There are others which are made artificially, and curiously, most frequently, out of bad-smelling compounds. The fusel-oil, separated out in the distillation of spirits, has a peculiarly nasty and sickening odor. It is used, after treatment with acids and oxidizing agents, to make the oil of apples and the oil of pears. Oil of grapes and oil of cognac are little more than fusel-oil largely diluted. Oil of pineapples, on the other hand, is best made by the action of putrid cheese on sugar, or by distilling rancid butter with alcohol and oil of vitriol. This oil is largely used for making pineapple ale. Many a fair forehead used to be damped with 'Eau de Millefleurs' without knowing that its essential ingredient was got from the drainings of cow-houses, though now it can be obtained cheaper from one of the constituents of gas-tar. Out of the latter is also got oil of bitter almonds, so largely used to perfume soap and confectionery. . . . Perhaps the most important use of gas-tar is in the manufacture of alizarin, the coloring matter found in the root of the Madder-plant, so extensively used at one time in Turkey-reds and in calico printing. The discovery of its artificial preparation from the waste products of tar has destroyed a great agricultural industry which flourished in Turkey, Holland, Alsace and other countries. . . . By a very interesting series of transformations one of the constituents of coal-tar has been changed into the coloring matter of indigo. Hitherto the cost of production of artificial indigo has been too great to allow it to take the place of natural indigo, the cultivation of which is one of the staple industries of the East Indies. But its cultivators tremble lest they should find themselves in the position of the growers of Madder by a cheap artificial production of indigo-blue from coal-tar."

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLES:—Landscape-art as a Profession.....	541
A Museum Specimen of Sequoia gigantea. (With figures.).....	541
Public Forests and Public Parks.....	542
Notes of a Summer Journey in Europe.—XVII.....	F. G. JACK. 543
Notes from West Virginia.....	Mrs. Danske Dandridge. 544
PLANT NOTES:—Dendrobium formosum giganteum.....	O. 544
FOREIGN CORRESPONDENCE:—London Letter.....	W. Watson. 545
CULTURAL DEPARTMENT:—The Grape Season.....	E. Williams. 546
Lettuce as a Greenhouse Crop.....	W. S. Turner. 548
Potting Soils.....	O. O. 549
CORRESPONDENCE:—Echoes from Madison Square Garden.....	F. N. G. 549
A Rare Plantain.....	H. P. Keyes. 550
EXHIBITIONS:—Boston Chrysanthemum Exhibition.....	550
Chrysanthemums at Philadelphia.....	551
NOTES.....	552
ILLUSTRATIONS:—Felling a Sequoia gigantea in Fresno County, Cal., Fig. 92.....	546
Stump of Sequoia gigantea, on land of the King's River Lumber Company, Fig. 93.....	547

Landscape-art as a Profession.

FEW weeks pass in which we do not receive a letter or two inquiring what inducements are offered by the profession of landscape-gardening to a young man who is looking for an agreeable and fairly remunerative calling. The inquirer usually seems to have an idea that this is an art in which one can readily become a master—indeed, that it is an art in which any one who is endowed with what he considers a “love for nature” is already well equipped. Of course, these people have a confused idea of what they mean by landscape-gardening, which may stand for one of the highest of the arts of design, or it may mean something which is purely handicraft. One of the leading daily journals in New England, for example, not long ago spoke of the planting of some Petunias and Geraniums about the pedestal of a statue in Boston as a specimen of landscape-art. Last week we tried to show that an artist was needed whose true province was to comprehend the work of the architect and the gardener and to arrange the building and its surroundings so as to form a landscape with unity of design. Successful work in this field certainly demands taste and training of the highest kind. There may be gardeners who are artists in their line, and architects, too, who are artists, but, after all, there is a necessity to cultivate the conception of landscape as composed of the harmonized works of these two kinds of artists. Whoever harmonizes them successfully, whether he calls himself a landscape-architect or not, is an artist of the first rank.

We can say, however, to all inquirers that there is little demand now for specialists in this field, for few people have yet realized its possibilities. It is true that there is a dawning conception of the truth in this matter, and the Columbian Fair grounds will, no doubt, prove an influence of surpassing importance in showing how an artist, working with and through architects, could make possible such a creation as the White City. When a few more men like Mr. Olmsted, who is neither an architect nor a gardener,

technically, shall have proved to architects and to gardeners, as well as to the people generally, the supreme importance of general design in the arrangement of buildings and grounds, there will arise a call for designers in this field. In very few of the professions are there many persons who excel in design, and, perhaps, there are not more than half a dozen men in the world who have achieved greatness in this field of landscape-art. To be eminent, much study must be added to original natural ability, for the artist must have enough knowledge of the principles of engineering and architecture and gardening to know their possibilities and to work through experts in them. And yet it is probable that as the call arises this profession will be crowded as full as any of the others. Most of these practitioners will, probably, do very indifferent work, but then there are not a few sculptors and landscape-painters and architects who do indifferent work, too.

This somewhat exalted and yet, as we believe, fundamentally true conception of the functions of the landscape-architect ought not to weaken the purpose of any one who is preparing to enter the field of what is often called landscape-gardening. If the day should ever come when designers such as we have described will always be employed in works of importance, there would still be as much need of an artistic gardener as an architect. Such a man would always be needed to carry out the details of any great design and realize its suggested features, and even now it is probable that a man who is possessed of a good knowledge of plants and some artistic training—the more he has the better—might be able in almost any suburban neighborhood to work up a practice in various subordinate branches of garden design and render good service to owners of small places. The call for such work is proved by the fact that planters are constantly asking for advice and suggestions, as every nurseryman knows, when he receives an order for plants. The ideal landscape-gardener, however, is free from such business connections. The reason of this is that the relation of the landscape-gardener to his client should be strictly professional; that is, he places his talent and training and experience entirely at the services of his client, and owes no business obligations to others. This does not mean that it is improper to take commissions for selling trees, still less does it mean that a nurseryman's agent may not have good ideas about planting, but the only way in which the professions can win complete confidence is to have no commercial connections.

It seems, therefore, that a young man of fair intelligence who is known to accept no commissions and buys his material in the cheapest market might soon gain a position with an assured, if not a large, income. Several of our agricultural colleges are giving instruction in the elements of garden-art, and furnishing their pupils with something beyond a knowledge of how to graft and propagate and do the other routine work of gardening. Besides this, there is a limited number of men in various parts of the country who are already doing creditable work in this field, and good schooling can be obtained by study and practice under their direction. In this way a class of men can be trained who, while not landscape-architects in the broad sense of the term, may yet do much to redeem country and suburban places from the commonplace look too many of them now wear.

A Museum Specimen of Sequoia gigantea.

A SECTION of a trunk of one of the California Big Trees is now almost ready to be set up in the Jesup collection of American woods in the Museum of Natural History in this city. Like the other specimens of this collection, this one is four and a half feet in long, measuring with the grain, but it is rather more than twenty feet in diameter, and when fully prepared the great wheel will be set up on its rim as the beautiful specimen of Redwood is near by. The tree grew on land now owned by the King's River Lumber Company, near Sequoia, Fresno County, California, a long

day's ride up the mountain from Visalia. To make transportation possible it was split into twelve sections, the centre-piece being round, and eleven others radiating from it. It is an admirable specimen, with perfect grain and apparently no wind-checks, although through one of the sections there is a narrow decayed tunnel something like eighteen inches long and an inch or two in width. Outside of this, however, the trunk is perfectly solid, and this decay probably came from some injury to the trunk, which may have been bruised by a falling tree; and if we can estimate time by annual rings of growth the accident happened at about the date when the Pilgrims landed at Plymouth. Mr. S. D. Dill, who has prepared all the specimens for this great exhibition, is now riveting the segments of the giant trunk together with great iron bolts, so that it will be perfectly solid when it is finally ready for its position in the centre of the collection.

The tree from which this trunk section was cut was one of a few trees left standing of a once magnificent Sequoia-grove, and the stumps about it show that their growth was very large, one not far from this tree being forty feet in diameter. The remains of the old mill which has turned these venerable trees into lumber is still there, but other mills are at work cutting from 125,000 to 130,000 feet every day. It may be said that the Converse Basin tract of Sequoias, which belongs to the King's River Lumber Company, is about ten miles back from the place where this tree was cut, and Mr. Moore, the Superintendent of the company, estimates that there is enough of that one kind of timber on the tract to keep these mills running at their present capacity for fifty years. When the trees which stand high up on the slopes of cañons are felled the logs are cut off into proper lengths. They are then blown apart by dynamite into halves, quarters and eighths, and a powerful steam-engine, with a steel cable, draws this split timber down to a greased tramway of round peeled logs, over which they are shot away to the mill, near the mouth of the cañon. They are then sawed up into lumber of proper sizes and floated down through a V-shaped flume from the mill to the railroad, sixty-two miles away. This flume is supplied by a large reservoir in the mountains. Although when dry the Sequoia is one of the lightest of American woods, it is very heavy when full of sap, and will not float readily until it is seasoned, so that the timber needs to lie some time before it is floated out of the mountain. The lumber looks very much like redwood, and is sold under this name. Indeed, it is only distinguished from redwood by the eye of an expert.

This particular tree was called "Mark Twain," and girthed sixty-two feet at eight feet from the ground and ninety feet at the surface. It was a straight, handsome tree some three hundred feet high, and without a limb for about two hundred feet from the ground. Mr. Moore estimated that it contained four hundred thousand feet of lumber, and the specimen cut, four and a half feet long, weighed over thirty tons. It took two men about three weeks to cut it down. The axemen chopped out deep notches on the opposite sides of the tree, leaving a comparatively narrow strip through the centre untouched. A notch was then cut at one end of this centre-piece on the side toward which the tree was to fall, as seen in the illustration (page 546). Two long cross-cut saws were then welded together and the workmen began to saw in horizontally opposite the cut last mentioned, and wedges were driven in until the tree toppled over. It was while the tree was in the act of falling that the photograph from which this illustration was taken was made by Mr. C. C. Curtiss. The other illustration (see p. 547) gives some idea of the size of the tree at the ground. Fifty men of the Lumber Company's force are here seen standing out on the sap-wood and bark of the stump, and the tools with which the giant was overthrown lie in the centre, where there is easily room for a hundred more men. Of course, the butt of the log that fell was sawn off above the bevel made by the axes, and in a plane perpendicular to the axis of the log,

so that the bottom of the specimen in the museum represents a cut about ten feet from the ground. A section of the log next above this has been secured as a specimen for the British Museum.

Every lover of nature must be rejoiced at the fact that the National Government has taken possession of several of the most extensive groves of Big Trees that remain in California, so that they cannot pass into private hands and be turned into lumber, a fate which has already befallen so many of these oldest and noblest inhabitants of our mountain forests.

Public Forests and Public Parks.

DR. EDWARD EVERETT HALE has an interesting article in the November *Cosmopolitan* on Epping Forest, which was restored to the public in the year 1882, after a long and stubborn contest, the corporation of the city of London conducting the fight in behalf of the people. The forest once covered an enormous territory, and at the time of the Long Parliament its area was still sixty thousand acres. This had been steadily encroached upon, and when the contest for its restoration began in 1871 the greater portion of it had been appropriated to private uses. When it was finally restored its area amounted to nearly nine square miles, or something over five thousand acres, still a magnificent domain, of about the same length, and somewhat larger, than the territory which it is proposed to convert into a public open space at the Blue Hills of Massachusetts, near Boston. The Blue Hills, however, or the Massachusetts Forest, as perhaps it may appropriately be called, since these hills gave the state its name, are very different in character from the Epping Forest, and, being of a mountainous nature, would be a grander possession for the people of Boston than Epping is for London.

Epping Forest had its origin as a public domain in the fact of its being common land. Many commons still exist in England as survivals of a primitive communal system—an institution that was transferred to New England by the early settlers, whereabouts the only traces now left are to be found in the local commons of various old cities and towns, that of Boston being the most prominent. Dr. Hale remembers, for instance, when cows were pastured and carpets were beaten on Boston Common, and although these practices were later forbidden by city ordinances, he thinks that very likely, if tested in the courts, those rights would be found yet to exist. The right of commonage in England still carries with it a great many privileges for the communities possessing it, and in the case of Epping Forest its exercise interferes considerably with the uses of the place for public recreation. The inhabitants of the neighboring villages are the commoners, and they pasture their cows, oxen and horses there, a practice which interferes with the undergrowth and the lower growth of trees. Goats and sheep, however, are said to be "non-commonable."

Another right of the commoners, that of "lopping," enables them to lop for fuel in fagots any branch not bigger than a man's finger. As firewood is valuable in that part of the world, this privilege was availed of to its utmost extent, greatly to the damage of the trees; therefore, under the new régime, the villages have been persuaded to surrender this right for certain other privileges and the sum of £7,000. Considerable damage is still done by forest-fires, set either carelessly or wantonly.

The forest is the favorite place of recreation for the people of London, and the railways carry excursionists thither at fares of a shilling for the round trip to and from the various stations, with half-fares for children. Sunday is a favorite day for excursions, and men go from London very largely in clubs, making special arrangements for picnic places, which are reserved for them. In making its application, each club has to be represented by some one who is responsible for the observance of the park regulations. The maintenance of order is entrusted to a chief and thirteen keepers. In winter and spring one hundred additional men are engaged as a sort of foresters, while in summer only fifty, or thereabout, are needed. The keepers have comfortable houses provided for them, free of rent, in various parts of the forest, and are allowed, besides, twenty-five shillings a week, while the other men are paid twenty shillings a week.

The roads are kept in order by the regular highway authorities. Of the roads Dr. Hale says that they are never finished with the "absurd detail which so often deforms American parks," but in good enough order for any practical purpose. "There is, however, no fiddle-faddle weeding of the edges or cutting out of occasional brambles, such as our park-makers fancy."

And again he says of these roads, "There is none of that dandy-Jack nonsense which weeds up by hand Rue and Mint and Cumin, which is the pharasaic passion of the people who have our great parks in charge. As a consequence, Epping Forest is kept in order at a cost which would sound impossible in Boston or in New York."

From these remarks by Dr. Hale it is to be feared that he does not recognize the distinction between a public park and a public forest. A public park, like Central Park, in New York, or Franklin Park, in Boston, represents for the entire people what the wealthy gentleman's private grounds do for that individual. They furnish pleasant open-air recreation of various kinds for multitudes. The way in which they are used requires the preservation of a high degree of order and neatness, and these are best secured by the most careful planting and maintenance; moreover, as in private grounds, a considerable degree of elegance is both appropriate and desirable. Ragged edges, ill-kept walks, etc., would give an appearance of shabbiness and neglect which could not fail to be reflected in a loss of respect for the place and consequent abuse on the part of the public.

Experience has always proved that it is easier to preserve neatly kept grounds from wanton or careless disfigurement than it is to protect open spaces which are not well maintained.

A public forest, on the other hand, using the word in its stricter sense, although in important respects different from a public park, is a most desirable form of pleasure-ground, and, fortunately, one that is coming into favor on this side of the Atlantic. The Lynn Woods, with its 2,000 acres of forest and lakes, may be compared with Epping Forest, and in the simple form of its development for recreative purposes there is a close resemblance to that of the London pleasure-ground. A public forest, by its nature, does not demand the finish of appearance required for an urban park. Park finish would be as much out of keeping here as an unkempt and shabby treatment would be in a city park. The roads should, of course, be as well constructed as possible. But the more their borders are left to a natural growth the better. The main things demanded are to give the trees the best chance possible to make the most of themselves; then to provide for an agreeable diversity of growth, and to open out from the roads and paths the best points of view and most attractive landscape-passages. The footways need simply to be made comfortably passable by the removal of obstacles that otherwise would cause unnecessary fatigue in their use. With provisions made for rest and refreshment of the public at convenient points here and there, and with proper policing and precautions against fires, little needs to be done in the adaptation of a forest to public uses.

The public forest, therefore, while one of the most delightful and attractive forms of pleasure-ground, is also remarkably economical in maintenance. Possibly, as time goes on, it may even be made to maintain itself from its products in fuel and timber. Both the public forest and the public park form exceedingly desirable, and even essential, features in the equipment of a large city.

Notes of a Summer Journey in Europe.—XVII.

NURSERIES for the propagation of plants are so abundant in certain directions in the vicinity of Paris that a traveler is very likely to wonder what can become of all the young trees and shrubs and other plants with which the fields seem filled for miles along the lines of travel. Large sections are given up to the raising of seeds, while it takes no small area to furnish all the fruits, vegetables and flowers consumed in the great city. Railroads, of course, bring much produce from a distance, but the largest and best portion of it is raised within a comparatively short early-morning drive from the point where it is to be marketed. The French are a horticultural people, and although pépinières, or propagating establishments, appear so numerous, they all seem to find a good and profitable patronage.

Of course, establishments of this kind vary as much here in the manner in which they are conducted and in reliability as in our own country. It is often interesting to note the specialties of particular dealers, for specializing has come largely into this business as into every other branch of trade, and there are now many firms which do a very large business in a quite limited variety of stock. Unfortunately, there was no time or opportunity for me to visit the famous seed, flower and testing grounds of the Messrs. Vilmorin at Verrieres and other places, but, on the recommendation of Monsieur Ed. André, I had the pleasure of inspecting the nurseries of Monsieur Croux at Sceaux, probably the largest and most interesting of

the suburban nurseries of Paris which are devoted to the business of raising trees for shade, ornamental and fruit purposes. The establishment is situated in a charming little valley in the midst of a beautiful undulating and highly cultivated country, and surrounded by other concerns practicing the same business. In the nurseries of Monsieur Croux a considerable proportion of the trees are grown until they are quite large, so as to meet the demand for specimens for city planting, which will make a show or give some shade at once. The nearness to the city and easy transportation renders this possible, and the trees commonly sold are each large enough to make a good load for a team.

The artificial training of fruit-trees is here carried on to a surprising extent. Probably in no other country are Pear and other fruit-trees so often trained to peculiar shapes, and there are in this nursery great numbers with forms varying from different degrees of espalier, which are most largely grown, to vase-formed, pyramidal, weeping, spiral and other artificial shapes. Of course, the standard, or normal, forms are very largely grown, but a foreigner is surprised at the proportion that are trained to peculiar shapes and at the care taken to get them perfectly symmetrical.

The collection of shade and ornamental trees and shrubs is a rich one and in admirable order, the soil being good and the climate congenial to healthy growth. The winter of 1890-1891 was unusually severe, said to have been the coldest in twenty years, the thermometer registering as low as eighteen degrees below zero of Raumur, with no snow to protect the ground. In consequence, handsome sturdy plants of evergreen Magnolia were very much injured, while even the common Ivy was badly frozen, especially young plants which trailed on the ground. The handsome *Andromeda Japonica* is grown here in quantities and frequently has its flower-buds blighted in winter, as it does in the much colder climate of Boston. Our *Rhododendron maximum* is much used as a stock, instead of the more generally employed *R. ponticum*, upon which to graft other varieties of *Rhododendrons*, as it is considered superior.

It is said that this section of the vicinity of Paris did not suffer so greatly as did some other suburbs from the shells of the Germans during the siege; but the extensive nurseries were ruined by the encampments of the enemy, and stories are told of greenhouses full of Orchids and other rare plants of great value, which, being abandoned, withered and died amidst the scene of desolation. But there were trees which came through these trying times without permanent injury, and Cedars of Lebanon, with trunks over four feet in diameter, are examples of them. Some good-sized trees of the rare *Cedrela Sinensis* are growing here. Although the regular blossoming period is said to be June, one of these trees was, at the time of my visit, in early September, bearing many long, loose, somewhat pendulous panicles of small white flowers. This *Cedrela* seems to be almost unknown to European and American cultivators, except in the vicinity of Paris, where it was introduced from Japan through Monsieur Eugene Simon, and in a few other localities. The tree has very much of the aspect of an *Ailantus*, and, indeed, after its introduction into cultivation at Paris it was described by Monsieur Carrière as *Ailantus flavescens*. But when it flowered in 1875 it was determined from the blossoms that it belonged to the genus *Cedrella* of another family, and that the species had already been described in a flora of China. Although the *Cedrela* has flowered for a number of years about Paris, it has not borne the fruit which would furnish the most striking character in distinguishing it from the common *Ailantus glandulosa*, or "Tree of Heaven." There is, apparently, still some confusion about it, for we find English authorities calling it *A. flavescens*. Its leaves closely resemble those of the common *Ailantus*, but they are usually not so large, the leaflets not so numerous, and they are without the peculiar little lobes on the margins near the base which characterize the leaflets of the "Tree of Heaven." When bruised they do not give out the disagreeable fetid odor of the latter. The flowers are said to have an agreeable fragrance. The wood is rather brittle, and the bark of the trunk is dark gray and rough, exfoliating in strips of considerable size. It is some years since this tree was first tried at the Arnold Arboretum, but it has not yet shown sufficient hardiness to withstand our winters without receiving serious injury. It appears to be little hardier than *Paulownia*, but, no doubt, in some sheltered and favorable situations in a climate as severe as that at Boston it will survive to become a tree. As botanists have collected specimens near Peking and other northern parts of China there is reason to believe that a hardier race may yet be procured than that already introduced. It is said that this tree is commonly cultivated for ornament in China, and that

in spring the young shoots and leaves are used as a vegetable for food.

High cultivation here, as in so many other parts of the world, seems to favor the increase of certain pests to vegetation. Large snails are here sometimes much more destructive to foliage than ever comes within the experience of New England horticulturists, and roots of Pear and other young trees are often badly eaten by white grubs. Mildews, too, revel in this rich vegetation, especially on Roses and Vines. To combat these the same formula is used which is employed in the vineyards of many other parts of France. It is composed of two kilogrammes of sulphate of copper and two kilogrammes of lime in 100 litres of water, and is applied in a fine spray. Without the addition of the lime the leaves are considered liable to injury by the copper sulphate.

A short visit to the principal nurseries of Messrs. Transon at Orleans introduced me to a collection very different in appearance from that at Sceaux, although largely composed of similar material. Trees and shrubs are grown here in very great quantities, and largely sold when quite small, a considerable portion of the stock being shipped to distant places or out of the country. Instead of large specially trained specimens, we find here good-sized areas given up to a single species or variety, the plants often not too large to be shipped by mail if necessary. As an example I may mention that I found thousands of *Spiræa Thunbergii*, which were propagated by green cuttings, this mode of propagation being very much resorted to in this establishment for a great variety of plants. The cuttings are planted almost as thickly together as they can stand in circular patches nearly a foot and a half across in beds of well-prepared sandy soil in the open ground. They are given one good watering and then covered with large bell-glasses or "cloches," which are in turn shaded from the direct sunlight by light mattings of straw. The one watering suffices, and the cuttings require no further moisture until the roots start, which may be in a week or two or a month or two, according to the kind of cuttings. The bell-glasses do away with the use of frames, so much employed in our own country, and they have several obvious advantages over them. They are made of thick strong glass, are about a foot deep and a foot and a half across at the mouth, giving room for a very large number of cuttings when closely planted together. They cost less than twenty cents each. When the cuttings have formed sufficient roots they are transplanted thickly together in rows in the nursery.

The firm has several branch nurseries in localities most suitable to the growth of particular classes of plants, but lack of time made it impossible to visit any of these. The general topography of the country is not attractive, being almost a plain, and the day spent here was the hottest experienced in Europe.

Arnold Arboretum.

J. G. Jack.

Notes from West Virginia.

ON my study-table this morning is a strange bouquet. It consists of white Chrysanthemums, true November blossoms, and a large spray of purple Persian Lilac, filling the room with fragrant memories of May. Our beautiful Persian Lilac-tree—for the shrub, fifteen feet in height and twenty in spread of branches, may well be called a tree—has been forced into bloom by the warm sunny days of the past month. Down in the shrubberies a Red Bud is blooming almost as lavishly as it bloomed in April. Such a blending of the flowers of spring with those of November is a strange sight, and befits this most singular of seasons. The fifth month of drought has now begun, and all the world hereabout is turning to dust.

Indoors we find some comfort in the large room given up to plants, where we can control the water-supply. Long experience in window-gardening has taught us that it is wise to have a background of beautiful foliage-plants for the few flowers that can be coaxed into bloom in the dark winter months. Some Palms and Ferns are a necessity, and there are some desirable plants which are charming both in and out of bloom. One of these, not often seen in windows, is *Imatophyllum miniatum*, which seems perfectly at home in an ordinary sitting-room heated by a base-burner. Our specimen grew finely in a shaded position on the piazza throughout the summer, and is now about to bloom. It has long sword-shaped dark green leaves of good substance, curving out gracefully on all sides. It requires a constant supply of water at the blooming period. It is of the easiest culture, does not seem to have any insect enemies, and is one of the most graceful and ornamental of plants. The ideal window-garden should be liberally supplied with fragrant plants. A little pot of Thyme is a constant joy, and a place should be found for a few sweet-scented

Geraniums, such as the Rose, Nutmeg, Apple and Lemon scented varieties. Heliotropes are capricious plants, often refusing to live under the most careful treatment. They need plenty of water, heat and sunshine. *Olea fragrans* blooms a long time, and, with care, makes a fine window-plant, filling the room with its delightful perfume. It needs sun, and the leaves should be frequently sprinkled, but too much watering of the roots will cause it to drop its foliage.

The plant-room should never be overheated. We endeavor to counteract the drying effect of our base-burner by frequent sprinkling of our plants, giving air in mild weather and by resting the pots on trays filled with moss.

This is the Chrysanthemum month, and we rely upon these flowers to put the finishing touches of beauty to the window-garden. Next month will be the turn of Roman Hyacinths, Freesias and of Jessamine and *Daphne odora*, which is now full of promise of bloom. Large smooth-leaved Begonias, that are almost always covered with scarlet blossoms, are very useful to lend a touch of gay color here and there, and some of the rough-leaved varieties, such as *Gloire de Sceaux*, are always beautiful. This has bright leaves of red-bronze, and should be placed where the sunlight can filter through the foliage. A striking defect in many window-gardens is the commingling of discordant shades of crimson and scarlet. This may be easily obviated by arranging all the light and dark scarletty reds in one window and the deep crimsons and crimson-pinks in another, with some white flowers in each.

For the past week the atmosphere has been dimmed by a dense cloud of smoke, through which the rays of the sun can barely struggle, while at night the moon gleams faintly with a strange red light. The smoke comes from the mountain fires, which have been burning in every direction north, south, east and west of us. The mountains themselves are obscured in the day-time, but gleam at twilight with an ominous glare that tells of the destruction of untold acres of timber. The aspect of the country is barren and desolate, parched to winter deadness. The rivers are so low that they have an unfamiliar appearance; even the Potomac has dwindled almost beyond recognition. The old people tell us that there has not been such a drought for forty years. Yet a good rain may yet save much of the wheat-crop.

Rose Brake, W. Va.

Danske Dandridge.

Plant Notes.

Dendrobium formosum giganteum.

THIS *Dendrobium* has long been known both to science and cultivators as the finest of that section of the genus to which it belongs—namely, the *Nigrohirsute*, or those whose stems are clothed with short dark hairs, as in *D. Jamesianum* and *D. infundibulum*. Although *D. formosum* has been known to gardens for over fifty years, its cultivation in Europe does not seem hitherto to have been very successful. It is widely distributed through India and Burmah, and is never found at any great altitude, but usually on the plains, where high temperatures are the rule both in winter and summer, with rain in some districts eleven months in the year. From these few facts, made known by those who had seen the plants growing, it has been hitherto thought necessary to grow *D. formosum* in the hottest house the year round, and we may add that it is fortunate that the plant is plentiful in India, otherwise we should not be able to procure it at such a low rate as we can at present. All plants need a season of rest, and, even though they come from the hottest regions of the globe, nature has provided for this period of rest in various ways. In Veitch's *Manual* we are told that "the plants are sometimes exposed to a temperature of 110 degrees, Fahrenheit, in the shade, when the stems are much reduced in size by the heat." During the growing season we keep the plants suspended in the house where *Calanthes* are grown, which is now kept at seventy degrees at night, and our plants have done remarkably well this season; the old bulbs made in their native woods are in some cases surpassed in size by those made this year, and they are now commencing to flower freely. After the flowering season the plants will be wintered in a temperature of fifty degrees at night in a cooler house, until signs of growth are apparent next March or April, when all the heat and moisture available will be given and maintained

until the flowering season is passed. Under this treatment Mr. George MacWilliam, of Whitinsville, Massachusetts, has grown and exhibited in Boston, perhaps, the finest *D. formosum* ever seen in cultivation, and this fact appears to be due to the long rest given in the cooler temperature. *D. formosum* is an exceedingly ornamental plant when in bloom, as the foliage of the past and present year is often retained on the plants as a set-off to the large pure white flowers, which are sometimes four inches in diameter, the lip having a conspicuous yellow blotch, varying in some plants from bright orange to pale lemon-yellow. The flowers are very durable, lasting several weeks in perfection. As the plants seem to grow best when suspended from the roof of the house, basket-culture or perforated pans seems the best treatment for them, as the roots like to ramble, and seem to resent confinement in pots. I have seen it stated that wood-lice do not feed on living roots of Orchids, being content to live on decayed portions, but I am satisfied that they are very partial to the roots of this *Dendrobium*, and for this reason the plants are often plunged in water a few minutes to drive out the wood-lice, when they are easily caught. It should be stated that this species flowers with the completion of growth, hence the rest is given after the flowering period, while in the majority of *Dendrobiums* the resting season precedes the flowering time. The statement of some eminent authorities that horticulture is necessarily an empirical art, seems to be supported by the fact that it takes a temperature of 110 degrees to rest this plant in Burmah, while we can accomplish the same result by reducing the temperature twenty degrees from normal, while we could not imitate the conditions noted under which the plant grew at home.

South Lancaster, Mass.

O.

Foreign Correspondence.

London Letter.

PHALÆNOPSIS CULTURE.—I recently visited the garden of Mr. Wigan at East Sheen, near Richmond Park, a garden famous for some classes of Orchids, and particularly for *Phalænopsis*, which are grown exceptionally well there. Mr. Young, the grower, kindly furnished me with some details of the treatment he finds most suitable for these plants, and these may be useful to others. The *Phalænopsis*-house at East Sheen is twenty-five feet by fourteen feet, with a low-span roof, and it stands on the north side of a high wall, so high as to completely shade the house from sunshine all winter. The house has bottom ventilators only, water-tanks below the stages, which are planted with *Fittonias* and similar low-growing foliage-plants. The paths are formed of gravel, which Mr. Young believes in keeping forked quite loose. The *Phalænopsis* are all suspended from the roof. They are planted in teak baskets, small in comparison with the size of the plants, and they are partly filled with potsherds, partly with sphagnum. Mr. Young does not use any charcoal, and he uses sufficient sphagnum only to hold the moisture about the roots of the plants in hot weather. They are all carefully replanted in May, when they are allowed to get dry, and then all the old moss is washed out with the aid of a syringe and replaced with new. The plants are not transferred to larger or new baskets unless it is quite necessary. During summer they are kept moist, almost saturated at the roots, and in hot weather the foliage is slightly dewed over with the syringe. The atmosphere is kept at saturation point, and the temperature at from seventy to eighty-five degrees. In winter less water is given; only when the moss about the plants is dry are they watered. Mr. Young dips the plants overhead in a bucket of water to water them. In winter the temperature is allowed to fall to sixty degrees at night and sixty-five degrees by day, except when the weather is mild, when the temperature is kept about five degrees higher. There are about 300 plants of *Phalænopsis* in this house, some of them being very fine

specimens with leaves a foot long. Almost every one of the best of the species and hybrids is represented, while of such kinds as *P. Schilleriana*, *P. grandiflora* and *P. Stuartiana* there are many fine plants. The effect produced by these *Phalænopsis* when in flower in January is a most beautiful one. To grow them well one requires much patience and proper conveniences, which are not of the most inexpensive kind; I think I must add also the element of luck as having something to do with success. But when they do behave themselves *Phalænopsis* fully repay all the trouble taken with them. A great deal appears to depend upon the position and shape of the house. If one can only find the house that suits *Phalænopsis* their cultivation then presents no exceptional difficulties.

CATTLEYA LABIATA (Warocquena).—This grand Orchid is the glory of the Orchid-house in October. It is the principal attraction one meets with in Orchid collections in England, a gratifying circumstance, seeing how rare and coveted this plant was before it was discovered in such abundance by the great English and Belgian Orchid collectors. It is good-natured under cultivation even for a *Cattleya*, and it appears to flower at least as profusely as the best of them. Where it cost guineas a year or two ago it scarcely costs shillings now. At a London auction sale this week I saw fine healthy plants, with a dozen or more pseudo-bulbs and in most cases bearing several flower-sheaths, sold for from eight to fifteen shillings each. A large box of cut flowers of this Orchid, shown by Messrs. F. Sander & Co., gave buyers an opportunity of seeing the character of the plant. It ought certainly to rank among the twelve best garden Orchids. One meets with so many frauds in the shape of Orchids—I mean in their having good looks coupled with a very bad character in the garden—that it is a genuine pleasure to find one to which too much praise cannot well be given.

CATTLEYA ALEXANDRÆ.—Of this I am a little suspicious, a plant of it having flowered lately at Kew—the first to flower anywhere, I believe. It is one of the *C. guttata* class, and, judged by the plant flowered here, one of the worst of them. The flower is three inches across, like that of *C. guttata*, var. *Leopoldii*, the sepals and petals dull greenish brown with a few reddish blotches, and the labelum rosy mauve. Of course, the Kew plant may be the worst possible variety, and the collector who pictured and described this discovery as a many-flowered beauty may not have seen anything so poor as the first flower that has opened in England. We hope not.

GLADIOLUS OPPOSITIFLORUS.—The re-introduction of this plant, which has lately been sent from the Cape to Kew, where it is now in flower, will, we hope, enable those who are interested in the history of garden *Gladioli* to decide soon a question which has been a puzzle for many years, since Dean Herbert's time, in fact. According to the worthy Dean, *G. Gandavensis* was raised in 1837 from *G. oppositiflorus* and *G. Natalensis*, and not, as was stated by others, including the raiser himself, one Beddinghaus, a gardener, from the last-named and *G. psittacinus*. According to Herbert, this latter cross is almost impossible; at any rate, he could not accomplish it, though he tried many times. *G. Gandavensis* was the first of the large-flowered, beautiful, easily cultivated hybrid *Gladioli* that originated in gardens. Monsieur Emile Lemoine, of Nancy, who is an authority on all questions relating to garden *Gladioli*, has recently stated that a French court gardener, named Souchet, set to work to breed *Gladioli*, about forty years ago, by crossing *G. Gandavensis* with *G. blandus*, *G. ramosus* (this, according to Herbert, is itself a hybrid between *G. oppositiflorus* and *G. cardinalis*), and he was soon followed by other French gardeners, who made of *Gladioli* a specialty. Our Mr. J. Kelway has done as much as any one man toward the improvement of *Gladioli*. He obtained Souchet's hybrids in 1857, and crossed and saved seeds from them. The point I wish to emphasize is this: If Herbert was correct in stating that *G. oppositiflorus* was the parent of two of the most valuable of the original hybrids, viz., *G. Gandavensis* and *G. ramosus*

(of gardens), then in that species we have the principal progenitor of the present magnificent race of *Gandavensis* Gladioli, and through them of the *Lemoinei* and *Nanceianus* races. *G. oppositiflorus* is six feet high and has a spike two feet long of large white flowers with amethyst stripes. At least a dozen flowers are open together, and they are arranged in two straight rows on each side of the spike. The first flower opened a week ago and it is still fresh. It is possible that the lateness of its flowering at Kew is due to the corms not arriving here till June. Should, however, the plant really flower regularly in October and November it might be possible, eventually, to obtain from it a race of Gladioli to bloom at Christmas. The exceptional stature of *G. oppositiflorus* and the chaste

ishment from twelve o'clock till sunset. This arrangement has worked well for fifty years. Now, however, the British public, or, at any rate, that portion of it which lives in the neighborhood of Kew, has decided to ask for access to the gardens for the whole day. It is surprising how many people there are who look upon Kew as a pleasure-park merely.

London.

W. Watson.

Cultural Department.

The Grape Season.

THE remarkable grape season of 1892 opened on my grounds with the ripening of Moore's Early on the 9th of September, just nine days later than the same variety ripened last



Fig. 92.—Felling a *Sequoia gigantea* in Fresno County, California.—See page 541.

beauty of its flowers ought to make it valuable to breeders of Gladioli. The Kew plants have been grown in pots in a cold house. They do not appear to be at all drawn.

EARLIER OPENING OF KEW.—An agitation has been started to get the gardens at Kew opened to the public in the morning as well as in the afternoon. At present the use of the gardens before noon is limited to professional people and others specially interested, such as painters, photographers, etc. These are admitted by ticket, about a thousand people annually availing themselves of this privilege. In the morning, too, all the rough and dirty work, watering and syringing indoors, are got through, so that by noon the whole place is in trim and ready for the crowds of people who then have the free run of the whole estab-

year, and there has not been a rainy day since which has interfered with harvesting the crop. This unprecedented state of things enabled the grapes to ripen thoroughly and to attain their best quality, so that there was less loss from splitting than I have ever experienced. The Pocklington suffered most from this, which proves this variety to be chronically weak in any season here, and on my soil its redeeming qualities do not suffice to warrant its retention; and yet I occasionally meet a man who relishes its pronounced foxy odor and tough pulp. On the other hand, Woodruff's Red, which has always cracked badly heretofore, has showed scarcely any tendency to do so this season. The clusters were large, generally shouldered and compact, and the grapes ripened up to a bright brick-red, which made them very attractive to the eye. The quality, to my taste, though never very good, was rather better than usual, but customers say they "look delicious," and perhaps

they sell better than if they tasted delicious and were less attractive to the eye.

Brighton and Lindley are my favorite red Grapes, and both succeeded remarkably this season. Both are liable to fail in setting sometimes, but this defect has not been noticeable this year. These grapes were near perfection, and I am glad to be able to detect a growing appreciation for fruit of such excellent quality. The late Lowell Mason once had some Brighton grapes for dessert, and when inquiring where they came from he was surprised to find that they were grown in his own garden from vines which I had sent him. On verifying the word of his gardener, he said, with emphasis, "Well, if we can grow such grapes out-of-doors, there is no need of bothering with hot-house varieties." Brighton is early and sometimes loses in quality late in the season. But the Lindley is later and supplies the place of the Brighton when its quality fails.

quality. It would seem as though such a season as this would have secured the best development, but I was not satisfied with it.

Green Mountain promises to be the earliest white Grape, with Colerain a close competitor. Eaton has size and good looks to recommend it, but it lacks that quality of sweetness which makes Worden and Cottage so desirable. However good a grape may be in other respects, if it lacks sugar with its acidity it is a failure. There is the same lack of sweetness in Grein's Golden, Missouri Riessling, Noah and Elvira. Lady Washington is better than ever, and Brilliant would delight the taste of a most exacting amateur. The new white Grape, Esther, fruited here for the first time and proves to be of good size, both in berry and in cluster, and of fair quality, although another season will be required to fully test it. The same may be said of Rockwood, and both appear to be late in ripening.



Fig. 93.—Stump of *Sequoia gigantea*, on land of the King's River Lumber Company.—See page 541

Niagara still holds its own against all competition thus far among the white Grapes for the size of berry-clusters as well as productiveness, while the quality meets with universal commendation when grown as I grow it and fully ripe.

Worden, Cottage, Wilder, Marianna and Herbert hold their own as desirable black kinds. Cottage sometimes drops badly, but this year the fault has not been apparent, showing that there is something in the season to counteract this failing. There is little to choose between Delaware and Berckmans. They are identical in size and color, and equally good in quality. The latter fails in fertilizing sometimes, which may be due to lack of proper company, but both are rather too small to prove profitable for me. Diamond has never reached the ideal which I had formed of it from high commendation in other sections. I am still hoping that another year will give an increase in size of berry and cluster as well as in good

Catawba, Highland and Black Defiance ripened fairly well, which they do not usually do here.

Anthraxnose was the only serious malady which troubled our vines, and there is very little mildew or rot, both of which can be brought under control. The early season came on slowly, and was very wet, which made cultivation difficult and troublesome. Warfare with weeds had to be constantly waged, with the advantage usually on the side of the weeds. The vines, too, felt the same exhilarating influence, and grew abnormally, so as to make pruning a great task. Since July, however, we have had a continuous drought, with only enough water in occasional showers to lay the dust on two or three occasions. Strawberry-plants have not made half their usual growth, and there has been far less fall setting than usual this year.

Montclair, N.

E. Williams.

Lettuce as a Greenhouse Crop.

IN recent numbers of this journal we have reported some experiments relating to greenhouses and greenhouse-work, an account of which was published, with full details, in the September *Bulletin of the Ohio Agricultural Experiment Station*. Mr. W. S. Turner, of the Horticultural Department of that station, has been giving some attention to the growing of Lettuce under glass, and we quote herewith a condensed statement of his experience in this direction :

For germinating Lettuce-seed well-pulverized compost soil is good, although we consider black muck better than anything else we have ever used, as it holds moisture well, is not lumpy, and the plants can be taken from it for transplanting without breaking the small roots, as happens in heavier soil. Use flats for sowing seed and first transplanting. They may be easily moved under benches, or from a warm to cooler, or light to darker location, as the seed or plants may require. This saves space, either in greenhouse, hot-bed or cold frame. Sow seed in drills one and a half or two inches apart, making the drill marks one-fourth of an inch deep, having the soil in flats somewhat packed, so that the marks will be of uniform depth. Cover by sifting with the hand sufficient fine-screened muck or soil over the box to cover the seeds from sight, smoothing over with a stick or board.

Care should be taken in watering to use a finespray, or, better still, to set the flats for two or three hours in the water-bench and irrigate from below. There is considerable danger of the young plants damping off in the dark weather of winter or early spring. To avoid this the flats are kept in as warm, well-ventilated a place as possible and the soil well stirred, using water very sparingly.

We transplant into flats two by two inches apart when the second leaves are well started; this will be about three weeks from sowing. The soil used should be of rich compost, heavier than for seeding, so that the plants may be taken up for the last transplanting with a lump of dirt about the roots. Stir the soil frequently between the rows to prevent damping off as before. They may remain in these flats about three weeks after this transplanting, or longer if kept in a cool place, or be carried out into a hot-bed or cold frame, as the case may be, for hardening off.

The soil in the beds into which the Lettuce is transplanted the second and last time should be a rich compost, or muck may be used with a mulching of fresh, well-pulverized horse-manure. Set the plants six or eight inches apart. Such varieties as Grand Rapids and Simpson do well six by eight, or even six by six inches apart, but head Lettuce requires more room, at least eight by eight inches apart. Cultivate between the rows as before; water often, but not too heavily, until the plants cover the surface of the soil, then water by pouring on in a solid stream between the rows, from hose or watering-can. This is in order to keep the water off the foliage as much as possible. If large-leaved Lettuce-plants are well drenched the water runs down toward the hearts, and it is very slow in drying out, a condition which is favorable for rot and mildew.

To fight the green fly (*Aphis*) use tobacco-dust, which may be had at any cigar factory; one cent per pound is the cost of it in Columbus. Sift it quite plentifully over the young plants soon after the first transplanting. Use again soon after second transplanting, but when the plants get large it will not be sufficient in the greenhouse, but will answer in hot-beds or cold frames. In the house, fumigate by burning the tobacco-dust, as it burns easily, makes more smoke than tobacco-stems, and is not so dangerous. After fumigating the lice will drop on to the soil, when by sifting the tobacco on them they will be quite thoroughly destroyed.

For convenience in note-taking and reference, we have arranged the varieties into five groups. This grouping is not intended as a systematic classification, but varieties of similar habits of growth are simply brought together. The first group embraces those that form quite firm heads. The second and third groups contain the loose-heading sorts; those with plain, or nearly plain, leaves being placed in the former and the curly-leaved in the latter. Those in the fourth group do not form heads, but loose bunches of leaves merely. Those in the fifth group are Cos varieties.

We consider the first and second groups undesirable to grow in this locality, because there is very little demand for them in the market. They are more subject to diseases than open-growing kinds, they require more space, and it takes a longer time for them to come to maturity. This is especially true of the second group. Of the first group, Perfection White, Forcing and Stone Head are the earliest. Tennis Ball is the best of

this class. Landreth's Forcing, Rawson's Hot-house and New Forcing are no improvement over the Tennis Ball, as far as we have been able to discover. New Forcing is very uniform, but not as firm as the Tennis Ball, and has a bronze tinge, which is not desirable.

Those of the second group resemble one another quite closely in growth, but vary in color. They are all quite good yielders, but very slow in forming heads; among them are Deacon, Boston Market, and the like.

Those of the third group are the most desirable for home and garden growing, being very vigorous, heavy yielders, as their weights indicate, also very crisp and tender; but they are too brittle for marketing, and of such form that they cannot be handled as head lettuce, nor as loose bunch-lettuce, and are, therefore, not desirable for market. Blonde Blockhead, Marblehead Mammoth and Sunset cannot be distinguished from one another except by their labels. This variety is the most desirable of the class, with the exception of the Onondaga and All Cream, which are very silky and pliable in texture, easily handled, but are tinged with red like the Prize Head, making them unfit for market, with possible exceptions. All Cream is much more vigorous, and a heavier cropper than the Onondaga. Tilton's White Star is not specially noteworthy. Henderson's New York is too dark in color to be desirable, but is a very strong grower.

Those of the fourth group resemble one another in growth, but are quite different in appearance of leaf and coloring. The Tomhannock is colored like the Prize Head, but does not form a head, and is much like the Grand Rapids in growth. Black Seeded Simpson is the quickest-growing of all varieties, rightly named by Salzer as the earliest (Salzer's Earliest). It is the most desirable kind for late spring growing in cold frame or out-of-doors. Nellis' Perpetual and Curled Simpson are very nearly alike and not particularly valuable. Grand Rapids we consider the best of all varieties for winter and early spring crop, because of its freedom from disease, fine appearance of leaf and bunch, and good handling qualities. Its one fault is that it is a little slow in coming to maturity, but it makes up for that in steady gain in weight after it is large enough to harvest. Many varieties begin to lose in weight as soon as mature, and hence must be cut promptly, but with Grand Rapids this loss is very small, even if left standing for some time. In the east, head lettuce is grown almost exclusively, probably owing largely to the demands of the markets. Grand Rapids lettuce sells as well or better than head lettuce in Columbus and most other Ohio markets, and is much more profitable to the grower, because it can be planted closer, thus giving a larger yield, and, as above stated, it is less liable to disease. It is so much superior for forcing to all other varieties that those who have given it a trial, plant it almost exclusively. No grower in this state need hesitate to plant it; in fact, he can hardly afford to plant any other variety. This may seem to be a strong statement, but the facts so far as observed will bear it out. Chicago Forcing is too tough in texture and too dark green to be desirable. Denver Market is too slow in growth and too liable to disease to be of any value. Boston Fine Curled, Green Fringed and Oak Leaf are only suitable for decoration, and may be raised in limited quantities for the holidays.

The Cos Lettuces are so little known and are of such dark green, dock-like appearance, that they could scarcely be given away in this locality, although the inside leaves are quite brittle and good when well blanched.

In market value the average weight of heads corresponds quite closely with the price. In early winter and late spring, small heads of two-ounce weight bring about twenty cents per dozen in this market; four or six ounce heads about forty cents per dozen, although a much larger quantity can be sold in late spring than in early winter. In late winter and early spring two-ounce plants will bring thirty to forty cents; four and six ounce plants from sixty to eighty cents per dozen. It is, thus, very desirable to have the best and largest crop come off in February and March. There is a moderate demand for lettuce at Thanksgiving-time and also at the holidays, but only a limited amount can be sold. All available space should be devoted to lettuce to come to maturity in February or March.

It takes eleven or twelve weeks to grow the early winter and late spring crop, and thirteen or fourteen weeks to grow the late winter crop, as the young plants grow slower through the dark months of winter. By the use of flats four crops of lettuce may be grown in a season, three in the greenhouse and one in cold frames or hot-beds, but all may be started in the house. The young plants occupy the flats about half the time of their growth, so that the entire space required by a crop is occupied only about six weeks. Three crops may be

grown in the house; the first is only a partial crop on account of the moderate demand, the second is the main crop. The third will be partially crowded out because so many other plants claim room in the house in early spring. The third crop may be grown between Tomato-plants with moderate success, and comes off a little before, or at the same time as, the hot-bed crop. For the last crop the plants may be transplanted into open ground or cold frames and then be earlier than ordinary outdoor lettuce.

The possibilities of production may be estimated as follows: We have grown crops on the middle benches that were harvested the last of February and the first of March that averaged one-half pound per plant; at 6 x 8 inches apart this gives one and one-half pound per square foot. At fifteen cents per pound the product would bring 22½ cents per square foot. A fair estimate for the season would be thirty cents per square foot of greenhouse space for the lettuce crop, and about one-third that amount for hot-bed space. This, it must be remembered, is only for Lettuce; other crops following in both house and hot-bed make the space much more valuable. Outdoor space may be counted at five or six cents per square foot. So it may be seen by summing up all the crops together that a reasonable amount of money may be made in raising lettuce, if one is successful.

The necessary elements of success in lettuce-growing may be summed up as follows:

Keep the plants in flats until ready to set in permanent bed. Use rich compost soil. Use good judgment in watering. Cultivate the crop as much as possible. Keep lower dead leaves well picked off. Watch for and fight the green fly incessantly. Grow Grand Rapids, unless the market demands other varieties.

Potting Soils.

HERE in New England, as in most eastern states, it is highly important that a supply of potting material be laid in under cover for the winter's use, and there is no better time to see that the main supply is sufficient to last until after midsummer next. Rose-growers and others are beginning to appreciate the importance of laying in a stock of loam suited to their purpose, and placing it where it can be thoroughly well frozen during winter. I am puzzled to know which are the worst foes of the gardener and florist—those of fungoid origin or insects and true worms after their kind. Of this animal class I feel sure we should have less to dread if our soils were carefully laid in when convenient, and not stacked up in heaps to exclude frost. If its kindly influence were rather invited and allowed to penetrate every inch of the soil, we should hear less of root-gall and eel-worms on Violets, Roses, Carnations, Cyclamens and other plants. Where it is not possible to freeze soil, and insect foes are prevalent, the other extreme must be adopted, and a system of heating the soil should be adopted. There is nothing new in heating the soil to kill insects in the egg and in other stages of growth. I well remember when a boy seeing my father bake his leaf-mold before he dared to use it for choice plants and Ferns. Our most careful attention should be given that the loam is of a good texture; we can make it as rich as we please afterward. Above all, we should see to it that we are not driven to scrape around to get enough soil together at the last moment for our needs. Here is where the trouble begins, which develops and spreads with such fatal effects later on. While I do not advocate storing soil for any length of time before using—six months is long enough—it is a great gain to have all the vegetable matter thoroughly well decomposed before handling it, for in this way much labor will be saved which would otherwise be needed in future weeding.

It was once considered necessary to the successful growth of the commonest plants, as the Carnation or Auricula, to have a great number of ingredients in the soil and in the most exact proportions. Much of this care in compounding soils has passed away with the old-school gardeners who practiced it. We can grow just as good Azaleas to-day in loam and leaf-mold as were ever grown in peat. Ericas and Boronias also thrive in a like compost if made porous. Good well-decayed leaf-soil is invaluable to the gardener, and great care should be taken when storing the leaves to throw out the sticks or branches, for these encourage fungus-growths. Where Pine-trees are common it is well, also, to avoid mixing in the pine-needles; the resin they contain prevents rapid decay, and is in itself injurious. The use of sand in potting composts is not so generally appreciated as it deserves to be. The value of silica in soils as plant-food is small, though appreciable, when compared with its value in rendering available all other plant-foods contained in the compost. If a soil becomes sour it is at once

poisonous to plant-roots, but given a liberal addition of coarse sand the most adhesive soil may be made fertile by its more perfect aeration. The water will pass through readily, and the air take its place until again replaced by water, and thus a perfect system of sanitation is maintained. The quantity of sand necessary must be determined by the texture of the loam.

Where Orchids are grown Fern-root is an essential for the winter's work. The large tufts of *Osmunda*, common in pastures, produce the best medium known to-day for the successful culture of Epiphytes. The tufts should be grubbed up from above the surface level and stored for winter, when it may be prepared at odd times by separating the rhizomes of the Fern from the fibrous roots. It is well, also, to keep the brown fibre separate from the coarser, because older, black portions which underlie the Ferns as they grow upward. *Osmundas* grow in wet, swampy soil as well as in drier uplands. The fibre is best when obtained from the latter source. This so-called peat is now largely exported to England for Orchid-culture there.

Sphagnum-moss is also an essential in most establishments, and to have it in a condition to start growing freely when used it should be gathered as late in the season as possible and stored where it will freeze. It can then be thawed out, cleaned and used at any time; it is a great mistake to be without it, as it cannot be procured here until April, when a great portion of the work is done for which it is required. Sphagnum needs a rest, like everything else that grows, and, if gathered late, it has already gone to rest and can be stored without injury if moist enough to freeze.

South Lancaster, Mass.

O. O.

Correspondence.

Echoes from Madison Square Garden.

To the Editor of GARDEN AND FOREST:

Sir,—Again a Chrysanthemum season, and, again, the flowers average distinctly larger than the year before. Truly, the cut-flower grower does marvelous things with the plants which he seriously takes in hand. It is only four years ago when the first exhibit of the profession here was made in an exhibition tent in Union Square, and to-day we find the market growers of flowers practically monopolizing the tables and easily winning the rich prizes. It may be questioned, however, whether the flowers are not being rather overdone, and whether there will not soon come a surfeit of such mammoth flowers which have their limitations. In a competition, of course, size counts, and the judges give the prizes to cubic contents every time, questions of taste not being entered on scales of points. Outside the competitions, the specimen blooms collectively, in masses of half-dozens and more, make bold and handsome decorations for large apartments. It is a curious fact, however, that there seems no place for a single bouncing bloom, even with the long stem, which is so potent a charm nowadays. In spite of its mass of color, it does not look well in any vase yet devised, and every one who noticed the numerous specimens carried through the city streets lately must have noted that they always seemed awkward things to manage. A flower which does not compose well with a fair damsel has decided limitations.

How to exhibit large specimen flowers in the least hideous way is a question which is perennially discussed in every horticultural society of the two continents, and there is much to be said on the side of the cup-hunter as well as on that of the committee responsible for making an attractive show for the public, and their views are apt to be somewhat divergent. The sharp cup-hunter favors the boards, because on them the flowers appear to the best possible advantage, as far as the points of competition go. He can dress his blooms and set them up to appear at their very best as the judges come, and there seems no reason why he should not be allowed these advantages. It is no secret that the New York Florists' Club do not favor boards. On their part they have entered into exhibition management with a very high purpose of providing attractive as well as instructive exhibits, and the prizes for cut flowers were mostly offered for those with long stems shown in single vases. The result appeared to me only a modified success, for on the low tables used and under the crowding of the exhibits, one, after all, only saw a glare of confused and sometimes inharmonious colors with no foliage effect. It may be possible to arrange these exhibits more satisfactorily, but the idea seems to me based on two false assumptions. One is that the Chrysanthemum has any foliage worth considering, and the other is that the only desirable stem is one as stiff as a very stiff poker.

The bane of the flower-show is the dilatory exhibitor who

unloads his flowers, in company with numerous others of his kind, just before the judges are ready to act and after the committee has about concluded that there will be nothing to show. There is no possible doubt that with a few hours' study such a competent committee as managed the late show could produce an ideally attractive effect even with the incongruous material, and I have no desire to criticise when there was so much to commend. It might be suggested, however, that the almost primary want of a Chrysanthemum-show is a wealth of foliage-plants to which one could turn one's eyes for rest. Of these we can scarcely have too many, and if the masses of flowers could be broken with them it would seem especially desirable. As no one was ever discovered at a show looking at those floral mops known as plants grown to single blooms, it might be well to drop these from future schedules and devote the money to the encouragement of the growth of plants furnished in a fairly natural way. Such plants have been known to give an impetus to the culture of the Chrysanthemum in gardens, and this seems a point to aim at in a flower-show.

The Chrysanthemum is such a sturdy and lasting flower when grown without heat that it was a pleasure to see the flowers in the Garden this season usually lasting their normal time, in striking contrast to those of last year. The season has been without strong frosts and very dry, and, apparently, no fire-heat had been used by most of the growers, a practice which should be universally followed. A soft, flabby Chrysanthemum is a miserable object, quite out of character, it naturally being one which appears at its best in the open under a clear sky, sparkling in frosty air.

Except in mere size, there does not seem often any material improvement in these flowers. Occasionally there is a new type more or less attractive, but we get no better colors than we have had for some years. Whites and yellows we have always had in abundance of every possible shade, while satisfactory pinks are, as ever, few and far between—none to-day better than Bouquet Fait in color. For grace and refinement, it seems to me that the ordinary grower need not search entirely among the latest productions. Some of the modern kinds, while very useful for the exhibitor, are not desirable for those who grow their flowers to less size, and often under rude conditions or some exposure. These kinds, naturally, have great substance and very numerous petals. Under ordinary culture they are not attractive, and they are specially subject to blight from the first breath of frost.

Every one must regret the absence from the shows of the attractive Pompons and the more fanciful varieties, as the Anemones, which are still enjoyed in many gardens.

Elizabeth, N. J.

J. N. G.

A Rare Plantain.

To the Editor of GARDEN AND FOREST:

Sir,—*Plantago media* was recently found in Framington, Maine. The local botanist who found it, not being able to identify it, sent it to Merritt Fernald, of the Harvard Herbarium, who classified it as above, and stated that so far as known it had only been found in the vicinity of Syracuse, New York. This is, therefore, an addendum to the newly published edition of the "Portland (Maine) Catalogue" of plants, which, of course, does not mention this species in its list of Plantains.

Framington, Maine.

H. P. Keyes.

Exhibitions.

Boston Chrysanthemum Exhibition.

THE growers of Chrysanthemums hereabout may well feel proud of their conspicuous success. The latest products of their skill showed evident progress; and, although the exhibition was not so extensive in some departments as that of last year, the quality of the plants and flowers was distinctly better.

Competition was keenest in the class of specimen plants. Mr. T. D. Hatfield, gardener to Walter Hunnewell, Esq., has of late years been a frequent winner in this field, and he again took the leading prizes. His twelve plants were excellent in every particular, and included specimens of Empress of Japan, Etoile de Lyon, Frank Hatfield, Garnet, G. Daniels, John Laing, Mrs. Bishop, Mrs. Fotler, Tupelo, V. H. Hallock, White Cap and W. H. Lincoln. Mr. Coles, gardener to Arthur Hunnewell, Esq., of Wellesley, was second in the same class with a group of neat, well-furnished specimens, and Mr. Kenneth Finlayson, gardener to Dr. C. G. Weld, of Brookline, third.

The first prize for six plants of Japanese varieties was also

taken by Mr. Hatfield, with Cullingfordi, Ivory, Louis Boehmer, Miss Annie Manda, Mrs. Walter Baker and Walter Hunnewell. The specimen of Louis Boehmer was the finest plant in the hall, and the best ever seen of this particular variety.

Mr. Atkinson, gardener to John L. Gardner, Esq., of Brookline, received first prize for a group of plants arranged for effect, and Mr. William H. Elliott, of Brighton, was second. Nathaniel T. Kidder, Esq., of Milton (Mr. William Martin, gardener); Dr. C. G. Weld and Francis B. Hayes, Esq., of Lexington (Mr. James Comley, gardener), also showed prize-winning groups.

Six admirable examples of superior cultivation were exhibited by Mr. Alexander Montgomery, of the Waban Rose Conservatories, Natick. The varieties were Domination, E. D. Adams, E. G. Hill, Hicks Arnold, Mr. H. Cannell and W. H. Lincoln. These plants were not entered for competition, but they showed a promising departure from the prevalent method of training, the branches being tied to wire hoops, making beautiful broad specimens of semi-globular form. Groups of plants were also furnished by the Bussey Institution, S. C. Lawrence, Esq., of Medford (Mr. Keith, gardener); Mrs. M. S. Walker, of Waltham, and Miss Mary T. Goddard, of Newton.

Mr. Coles secured first prize for a specimen plant of an incurved variety, with Mabel Ward. Mr. Hatfield was first with A. G. Ramsay as a specimen Japanese kind, and a like honor was conferred on Mr. Coles' Savannah, a specimen Pompon. Yellow Ball, a fine plant of which was exhibited by Mr. Hatfield, is a good variety for decorative purposes. The plant was raised by H. A. Gane, of West Newton, and is of very distinct habit and well adapted for specimens, as it is so sturdy that it needs no stakes. It carries handsome flowers of deep orange, and is also excellent for cut flowers.

The greater part of the plants were arranged on the upper floor of Horticultural Hall, and the effect of the grouping could have been materially improved by the introduction of a few Palms, Ferns and other foliage-plants. The glare of color was too dazzling to please, and no arrangement of the plants, so stiff and formal as they usually are when grown for exhibition, can have a pleasing effect without the aid of some greenery as a foil to the color and some graceful foliage to relieve their harsher outlines.

A similar lack of toning material was even more evident in the lower hall, in which the cut blooms were regularly disposed in vases. The most beautiful object here was an immense vase filled with flowers of the finest quality, representing a large number of the choicest varieties, from Mr. J. Brydon, gardener to John Simpkins, Esq., of Yarmouthport. Messrs. Montgomery, of Waban, and E. A. Wood, of Newton, supplied an abundance of cut flowers, which carried off most of the best prizes. Messrs. Brydon, Galvin Brothers, of Boston; James Wheeler, gardener to Jos. H. White, Esq., of Brookline, and Laurence Cotter, gardener to C. V. Whitten, Esq., of Dorchester, were among the most successful competitors, and some excellent flowers, of the leading varieties, were exhibited by Mr. A. H. Fewkes, of Newton, and Mr. Hatfield, the latter's bloom of Etoile de Lyon being without a rival in the show. Mrs. Jerome Jones, as seen at this exhibition, is a very attractive variety, and it is likely to be one of our most popular Chrysanthemums.

Seedlings were quite numerous, and comparatively few of inferior quality now find their way to the exhibition tables. Mrs. F. L. Ames, a very large, partially reflexed flower, from Messrs. Pitcher & Manda, of Short Hills, New Jersey, was awarded first prize as the best yellow. Mr. Brydon's Snowflake, large pure white, with straight florets, was the best of its section, and it was honored accordingly. The best pink, Carrie Bell, of an exquisite tint, was contributed by Mr. J. Eaton, Jr., of New Bedford, and the best red, Oxblood, by Mr. G. B. Gill, of Medford. Clarence, a large orange-red, exhibited by Mr. Eaton, was the best of any other color in competition. A certificate was given to Mr. C. D. Kingman for Nemasket, a large and very perfect flower of pure white color, with a slight tinge of pink in the outer florets.

Some very promising unnamed varieties were exhibited by Mr. Hatfield and the Messrs. Pitcher & Manda, and there were a few exceptionally good named kinds in the New Jersey firm's lot, notably Miss Madge Clarke, deep pink; Mrs. Henry Graves, pale pink; Mrs. Leslie D. Ward, orange-yellow; Mrs. Walter Cutting, creamy white, tipped pink, and Mrs. W. P. Hinzay, bright red. Mrs. J. W. Crouch, exhibited by Messrs. E. G. Hill & Co., of Richmond, Indiana, is a good incurved flower of purplish color.

The principal miscellaneous exhibits were Carnations, Begonias and *Strelitzia Reginae*, from various parties, Roses from the Waban conservatories, and a vase of the new Rose, Ameri-

can Belle—an excellent sport from American Beauty, with flowers of a lighter shade—from Mr. John Burton, of Chestnut Hill, Philadelphia. Mr. Burton's Rose was awarded a silver medal.

Chrysanthemums at Philadelphia.

THE autumn flower-show at the hall of the Pennsylvania Horticultural Society last week was universally pronounced one of the best ever held there, and was remarkable for fine plants, even at Philadelphia, while the cut blooms were very numerous and of good quality. The Japanese type prevailed to the exclusion of the Chinese and the Pompon, and but one specimen of the Anemone-flowered form was noted, a good yellow, Ada Strickland. Six flowers of this variety were conspicuous by their striking contrast with the rest of the exhibition. The first prize for the best vase of twelve white blooms was awarded to Ivory, which has held best place here for several years. The exhibitor was Fred. R. Sykes, gardener to Mrs. G. Dawson Coleman. Mrs. M. J. Thomas, shown by Pennock Bros., a cream-white, very large flowers, with broad, flat, waxy leaflets, took second premium. It was a matter of local pride that these varieties were both originated by Wm. K. Harris. The third premium was taken by Mrs. C. I. Thompson, grown by Thomas Monaghan. The new white, Mrs. Robert Craig, was exhibited by Robert Craig; it is much like Ivory, but smaller. For the best vase of twelve pink flowers David Cliffe took first premium with some excellent blooms of an unnamed seedling. Second premium and a certificate of merit were awarded to Miss Sue T. Price, a clear bright pink seedling of medium size and true Japanese form, exhibited by Robert G. Carey. Each petal of this variety stands out straight, making a well-formed globular flower. The color is pronounced even better than that of Mrs. J. N. Gerard. Maud Dean, grown by Robert Craig, received third prize. Hugh Graham received first prize for twelve yellow flowers with a vase of E. Hitzeroth and A. E. Weidener, good specimens of which were frequent in other classes. H. E. Weidener, exhibited by Robert Craig, received second premium, and twelve blooms of Eldorado, shown by Thomas Monaghan, took third prize. Among other notable yellows not in this class were the strikingly beautiful flowers of Lewis Childs' Madeira, or Golden Ball, and the new Mrs. John Gardiner, from Robert Craig, winner of the Gardiner cup. For the best vase of twelve flowers of any other color, Mars, exhibited by Hugh Graham, took first premium. Second premium in the same class to Mrs. A. J. Drexel, exhibited by Robert Craig, and third premium to Thomas Monaghan for Black Beauty, a large very deep crimson, a flower which was shown by Mr. Monaghan in very good form at New York, beside Goliath, another remarkable seedling of his.

The habit of stems and character of foliage were considered in all the cut exhibits, and all cut flowers were required to have stems not less than twelve inches long. Tall glasses and vases were used throughout, there being but one exhibit on an exhibition board, and this was a selection of twenty-eight remarkably fine flowers from Judge Benedict's place on Staten Island, Wm. Tricker, gardener. Hugh Graham received first prize for fifty-two blooms, one of a kind. The flowers were excellent, with long stems and generally well-known varieties. A notable white among them was Marguerite Graham. Hugh Graham also took first prize for a vase of fifty cut blooms with very long stems and good foliage. H. G. Standen was awarded first premium for twenty-five cut sprays in vases, one of a kind, and for twelve naturally grown sprays, twelve varieties. Ross-trevor, a seedling, shown by Hugh Graham, received a certificate of merit. The flowers are large, bronzy yellow, although they seemed dull beside Golden Wedding. This flower, which last week took three prizes in as many classes in New York, while a little past its best, was the sensation here as at Madison Square Garden. The deep golden color contrasted to great advantage with the lemon-yellow of E. Hitzeroth and A. E. Weidener. It was not entered for competition, but was declared by the judges to be the best yellow variety exhibited to the present time. A silver medal was awarded to Golden Wedding last year at Philadelphia.

A very notable large delicate pink new seedling, Pink Pearl, grown by John N. May, was one of the best Chrysanthemums at the exhibition, and is spoken of as the probable successor to Mrs. J. N. Gerard. It received a silver medal. Fascination, a creamy white, is another seedling of Mr. May's, and received a certificate of merit; Farview, a good amaranth, grown by Wm. Tricker, was also awarded a certificate of merit. Among other new seedlings in the cut-flower class was Leila, a large loose delicate pink, not a marked gain in color; Mars, grown by Hugh Graham, similar to Cullingfordi, but larger, though

it does not appear to be as bright. It is well worth further trial. For Mrs. Craige Lippincott, Hugh Graham received a silver medal.

Among many seedling plants having points of merit George W. Childs Drexel, a good pink with long reflex-twisted florets, grown by Mr. James Verner, took the Blanc prize for the best seedling of 1892. Mrs. James W. Paul, Jr., a well-grown plant from Robert Craig, bore very large incurved pink flowers. A good amber-yellow, identified as No. 12, was grown by Wm. K. Harris. Another unnamed flower of a pleasing plum color, and John Goode, were also seedlings of Mr. Harris. John Goode is one of the best of the new flowers, a beautiful lively pink, maturing to a deep cream or delicate yellow at the centre, and of medium size.

Ten specimen plants grown by James Verner, gardener to A. J. Drexel, at "Runnymede," were marvels of cultivation in the number, size, and coloring of flowers. They were declared the best plants ever shown in Philadelphia, and included Puritan, Robert Bottomley, Miss Minnie Wheeler, Wm. H. Lincoln, Roselyn, Cullingfordi, Hicks Arnold, Frank Thompson, Mrs. Irving Clark and Mrs. A. J. Drexel. The last-named is the seedling shown for the first time in 1891, by Robert Craig. It is a deep rich crimson, of an unusual tone. Second prize for ten plants was awarded to J. Wm. Colflesh. John McCleary and W. K. Harris took prizes for similar collections.

A plant of Mrs. A. J. Drexel was awarded first prize as the best plant exhibited. A specimen of George W. Childs was almost equally fine, and its intensely bright crimson flowers, with golden reverse, were striking. W. H. Lincoln showed still among the best yellow-flowered kind, and there were remarkably good plants of Kioto, the new Mrs. Maria Simpson and Mrs. John G. Whilldin.

For the best three plants introduced to commerce during 1892 the Clothier prize was awarded to James Verner for Mrs. Robert Craig, H. F. Spaulding and Mrs. J. Eyermann. There were many classes and arrangements deserving special mention, as a double row of fine yellow plants of the best varieties in the front of the hall; a collection of six new varieties by W. K. Harris, and a large collection of hardy evergreens from Samuel C. Moon, Morrisville. On the stairway and in the halls on the upper floor evergreens and autumn leaves were tastefully arranged, and brought into relief against draperies of pink and white. The decoration of four tables was heavy and ungraceful.

A number of standards were shown, but no single-flowered specimens, and the collections of tropical foliage and flowering plants, which have been a feature of previous years, from Mr. George W. Childs, Mr. Henry F. Dreer, Mr. A. Blanc and Pitcher & Manda were greatly missed.

Of the six large decorative specimens sent by Miss M. L. Baldwin (Wm. Joyce, gardener) three received the first premium. Mr. Thomas Long, city gardener for Mr. Drexel, had twenty-five magnificent foliage-plants. His collection of twenty-five Ferns was unsurpassed, and every one was noteworthy. Robert Craig's group of glaucous Araucarias and Crotons and Mr. Charles D. Ball's commercial exhibit of foliage-plants were good, as they always are.

Of the Carnations, the large loose Lamborn, with its deep calyx, and Indiana still larger, were admirable whites, although Lizzie McGowan seemed altogether the best Carnation of this color which is grown near Philadelphia. Edna Craig seems to be holding a good place over Grace Wilder, being larger, with firmer stems and an admirable keeper. This variety took the first prize for a pink flower, while among the yellows Buttercup remained the best. Several new seedlings of promise were shown, and prizes, besides those noted, were taken by H. E. Chitty, Edwin Lonsdale, W. R. Shelmire and Griffin Bros.

A large beautifully arranged vase of the new Rose, American Belle, was shown by John Burton, of Chestnut Hill. It is a distinct gain in color, and its early habit makes it specially valuable. The clear pink of freshly cut flowers fades out a delicate pleasing shade instead of the undesirable blue or lilac which American Beauty takes on at that stage. It attracted as much attention as it did in New York.

Pennock Bros. and Joseph Kift & Son received prizes for the Meteor Rose, brought to this country some years ago through the gift of Mr. Henry Bennett to Charles F. Evans, and which at first was not grown with success. It promises to be a favorite here, as it already is with Mr. Pierson and other leading growers about New York. Mrs. W. C. Whitney, grown by John N. May, and similar in form and delicious fragrance to the once popular Francis W. Bennett, received first premium offered for the best six blooms of a new Rose. Other varieties, of which remarkably fine specimens were shown, were Madame

de Watteville, Sunset, Bridesmaid, Perle des Jardins, Madame Cusin and La France.

About \$3,000 were distributed in prizes.

Notes.

According to the *Journal of Horticulture*, one of the most interesting of late introductions among Ferns is the variety *Imbricatum* of the true Maidenhair (*Adiantum Capillis-Veneris*). It is not only very hardy, but the writer ventures to call it a miniature *A. Farleyense*. It certainly will be a treasure if with hardiness it combines the airy grace of a *Farleyense*.

One of the brightest in flower of the new Cannas is *Alphonse Bouvier*, which was shown in admirable form by F. R. Pierson at the Madison Square *Chrysanthemum* show. The large flowers are so brilliant that even *Madame Crozy* looked dingy beside them. *Sarah Hill* was another variety of peculiar brilliant tint, while *Capitaine P. de Zuzzoni* is an admirable yellow.

The *Revue de l'Horticulture Belge* recommends the following mixture as being the best fertilizer for ornamental-leaved *Begonias*: Superphosphates, 33 parts; nitrate of potassium, 17 parts; nitrate of soda, 25 parts; sulphate of lime (gypsum), 25 parts. Pots which hold a litre (four-inch pots) require about two grammes, say 31 grains, of the mixture, and others in proportion.

A gigantic *Camellia* is growing near the royal castle at Pillnitz, near Dresden, Germany. The tree is twenty-four feet high, and produces annually at least 50,000 blossoms. It is supposed to have been imported from Japan about a century and a half ago. It is planted in the open ground, but every winter a structure of boards is built around it to keep out the severe cold of winter.

Mr. Wm. M. P. Bowen, a member of the national Committee upon the Improvement of Highways, has written a circular to citizens of Rhode Island in regard to the subject, in which he states that half a million dollars a year would hardly cover the annual loss and waste which the people of Rhode Island suffer from bad roads, and that this loss amounts to an annual tax of about two dollars upon every inhabitant of the state. If this tax were saved, in two or three years it would pay for putting all the main roads in Rhode Island in first-class condition.

The magnificent *Sabal Blackburniana* which has been for many years a feature of the Ghent Botanic Garden and was one of the finest Palms of its kind in Europe, has been cut down. Its height was fifty-five feet eight inches, its fronds more than six and a half feet across, with petioles nine feet long. It was destroyed because the old, dilapidated glass-house which covered it is to be replaced by a smaller and more strictly utilitarian building, and its destruction is pronounced an act of vandalism by the European horticultural journals.

The tallest trees in the world are found in the gulleys of Victoria, one of which is 471 feet high. Nearly every county in England has its favorite Oak, the largest of which is the *Cowthorpe*, of Yorkshire, which has a circumference of eighty feet. The *Carnoch Ash*, in *Stirlingshire*, is thirty-one feet in circumference. The *Tortworth Chestnut*, in *Gloucestershire*, was used to identify the boundary in the year 1135. It is said to have been the first tree that was ever planted in Great Britain by man. The largest Cedars in England are at *Clumber*; they measure twenty-seven feet in circumference. There is a *Yew-tree* at *Crowhurst*, in *Sussex*, thirty-three feet in circumference. The "*Crawley Elm*" is sixty-one feet in girth. The largest *Beech-tree* is to be found in *Cornbury Park*, *Berkshire*, and the largest *Sycamore* is at *Cobham Park*, with a circumference of twenty-six feet.

A new feature in the construction of greenhouses has recently appeared in Europe. Mr. *Falconnier*, an architect at *Nyon*, *Switzerland*, has invented a hollow brick, which is made of glass. These bricks are not only capable of being used in greenhouse construction, but there already exists a house in the park *Tête d'Or*, at *Lyons*, *France*, in which such bricks have been used in connection with iron for the arches of the frame-work. The bricks are used as ordinary bricks would be, and are fastened together either with lime, cement or plaster. They are translucent, and are blown in the same manner as glass bottles are, in order to make them hollow. They are 20 centimetres long, 14 centimetres wide and 115 millimetres thick (say 8 inches long, 5.5 inches wide and 4.5 inches thick), and sell for twenty-four francs a hundred; this price, however, could be much reduced in case of a growing demand for them.

In the course of a discussion which is going on in the English horticultural papers about stands for showing *Chrysanthemum*-blooms, the *Gardeners' Chronicle* prints an illustration of some *Chrysanthemums* exhibited on boards in Tasmania. The flowers looked just like the best ones in an English or an American exhibition, and they show, as the editor of the *Chronicle* remarks, how well flowers can be grown on the opposite side of the planet. He adds, however, that these people in the colonies would render a much greater service to horticulture by developing their native flowers than by slavishly imitating European customs; and Tasmanian flowers are singularly beautiful. This is a bit of advice which the world has taken a great time to learn. Many of the beautiful Japanese plants which have been sent to this country by Mr. *Hogg* were found growing wild and were neglected by the Japanese themselves, while their gardens were filled with plants from China and many other exotics brought there by Dutch traders.

For many reasons trees taken up late in autumn may be in better condition for setting out than such as have been removed earlier, and if they are heeled in by burying the roots and part of the stems they will be better prepared for setting out in spring. Their value next year will depend largely upon the treatment they now receive, and therefore these precautions, which are noted in the *Country Gentleman*, should always be observed. The ground selected should be dry, well drained and free from stones, so that the soil in contact with the trees can be finely pulverized. No stones, clods, sods or weeds should be used. Dig a pretty shallow trench, place the trees in an inclined position, and not massed so closely as to prevent the fine soil from penetrating every part and leaving no unfilled interstices. When they are well covered smooth the whole with a rounded surface, and if there is any danger from mice dig a flat trench around the whole ground occupied by the trees, so that they may be within and protected by an inclined bank of smooth earth, up the sides of which the mice will not undertake to ascend under the snow.

In the October number of the *Proceedings of the Royal Geographical Society*, of England, there is an interesting article on British Guiana by Mr. E. Im Thurm, who, for the past ten years, has been administrator of the north-western region of that country. This region, he says, falls naturally into two divisions—the upland savannahs, a dense belt of forest, which in some places is more than a hundred miles in breadth, and the low mangrove-swamps along the coast. The only method of communication is by water, the many rivers being connected by a very extensive network of narrow natural streams and artificial canals. In the forest-belt these water-ways are like verdurous tunnels, into which the sun never sends a direct ray, although they are enlivened by innumerable torches of bright color in the shape of epiphytal Orchids, immense butterflies and myriads of humming-birds. The Indians live much in the same way as they did before the days of Columbus, although their old local customs and habits now bid fair to disappear as the country is opened up in the search for gold. The extraordinary fertility of the soil is illustrated by the fact that in his own garden, which was drained and cleared hardly more than two years before he wrote, there already stand avenues of trees (*Casuarina*) forty feet high, which he then planted.

In some parts of the country this year where apples are very abundant they are shipped away by the car-load to be turned into cider. All sorts are used—winter apples and fall apples, ripe and unripe, large and small, sweet and sour—and all are mixed together and sold at the same price, as if one apple was as good as another for cider. In France, although it is the home of the vine, much more attention is given to cider-making than is done in this country, and the different varieties of apples are classed according to the abundance and quality of the juice they yield. Years ago certain kinds of apples were largely planted here on account of the quality of cider which they yielded, principal among these being the *Harrison* apple, a little, hard, green, late autumn fruit, which was very juicy and of a special acid flavor. These apples were mixed sometimes with the *Campfields*, which gave a rich, sweet juice. The *Gardeners' Chronicle* for the current week has classified from the *Herefordshire Pomona*, a list of apples which are considered the best for cider in England. One of these, called the *Devonshire Royal Wilding*, is said to produce cider which as long ago as 1753 brought five guineas a hogshead, when ordinary cider brought but twenty shillings. It is rather remarkable that although there are a few varieties in this country which are esteemed especially good as vintage fruits, very little prominence is given to this quality in general descriptions of apples, new or old.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLES:—Horticultural Education.....	553
A German Pleasure-ground	554
Notes of a Summer Journey in Europe.—XVIII.....	<i>J. G. Jack.</i> 554
Color for the Lawn in November	<i>R. M. T.</i> 555
NEW OR LITTLE-KNOWN PLANTS:—The Chrysanthemum, Golden Wedding. (With figure.).....	556
FOREIGN CORRESPONDENCE:—London Letter.....	<i>W. Watson.</i> 556
ENTOMOLOGICAL:—The Oak-pruners. (With figures.)..	<i>Professor John B. Smith.</i> 557
CULTURAL DEPARTMENT:—Top-grafting Apples.....	<i>T. H. Hoskins, M.D.</i> 558
Basket-plants for Conservatories	<i>W. H. Taplin.</i> 558
The Cultivation of Cattleyas.....	<i>E. O. Orpet.</i> 559
Agapanthus umbellatus, Thunbergia erecta, Clerodendron fallax, <i>M. Barker.</i> 560	<i>W. W.</i> 561
<i>Begonia decora.</i>	<i>W. W.</i> 561
CORRESPONDENCE:—California Oranges and Lemons....	<i>Charles Howard Shinn.</i> 561
Pedigree Seedling Chrysanthemums.....	<i>T. D. H.</i> 561
New Cyripediums.....	<i>Robert M. Grey.</i> 562
Snow Scenes.....	<i>Fred W. Card.</i> 562
EXHIBITIONS:—The Cincinnati Chrysanthemum Show.....	562
RECENT PUBLICATIONS.....	563
NOTES.....	564
ILLUSTRATIONS:—Larva, pupa and imago of Oak-pruner, Fig. 94.....	557
Burrows of Elaphidion in branches of scrub Oak, Fig. 95.....	557
New Chrysanthemum, Golden Wedding, reduced one-third, Fig. 96..	559

Horticultural Education.

WHILE scientific papers in Europe are discussing the value of systematic schooling in horticulture and agriculture, and while many doubts are expressed as to whether there is any proof that such training has ever been a practical help to farmers and gardeners, schools of agriculture and horticulture are multiplying in almost every country in Europe, and the instruction given in the older ones is growing more broad and more thorough—that is, more truly scientific. In our own country it must be confessed that the agricultural colleges in many of the states make a very poor showing both in the matter of attendance and training. The colleges in a few states, however, have already become centres of influence and places to which farmers and gardeners turn with confidence when they wish for help or enlightenment. It is the college entomologist to whom the farmer sends specimens of destructive insects for identification, and the professor not only gives the enemy's name, but explains how he may be defeated. It is the mycologist of the same institution who is consulted on plant diseases, and its chemist who answers questions about soil and fertilizers; and in this way a vital connection has been established between the farms of the state and its college laboratories. Where such relations have grown up there is no question as to the advantage of scientific knowledge and training to all who cultivate plants for ornament or use.

Of late years the practice of furnishing short courses in agriculture has been growing among the colleges, and several of them now offer such privileges to meet the needs of students who have only the time or means to spend a single term, or perhaps two terms, at the university. A circular just received from Cornell University outlines a short course which has just been opened there, which consists of studies partly prescribed and partly optional. Attention must be given to agriculture five hours each week and to chemistry three hours, and the studies in these regular

hours are on fundamental subjects with which every one should be familiar, whether his field of practice is the garden, the orchard, the greenhouse or the farm. Besides this, there are optional studies, such as entomology, botany, dairy husbandry, animal industry, poultry-keeping and the like, in which practical exercise is given in specific branches. We are especially interested, however, in the optional course in horticulture, which offers, in the first place, instruction in fruit-culture with practical work in the best methods of pruning, training and planting, and the determination and discussion of varieties, with the advantage of an admirable collection of orchard-fruits and small fruits for study and practice. Vegetable gardening is also taught, and includes practical work during the winter in the forcing-houses, where Tomatoes, Cucumbers, Mushrooms, Beans, Lettuce, Radishes and other plants are grown as winter crops. The propagation of ornamental plants and floriculture embraces practice in all methods of reproducing plants, from the sowing of seeds to the making of cuttings, budding and grafting. Instructions here are given in the laboratories, which are greenhouses designed for propagating purposes. Lectures and demonstrations are also given in the management of ornamental plants together with practice in the preparation and application of all the remedies for insect and fungous diseases.

The latest attempt to popularize instruction of this sort comes from the Agricultural College of Pennsylvania, which just announces what is called an "Agricultural Chautauqua," which provides for a course of home reading upon agricultural and horticultural subjects to be pursued under the general direction of the college. This course covers three groups of subjects—agriculture, animal husbandry and horticulture—and under each group five standard books are selected which are to be read by students. For those who desire to do more than this a system of home examination has been provided, and readers who pass a satisfactory examination upon a group of five studies will receive a certificate, and a satisfactory examination upon two groups will entitle one to a diploma. This course is free to every one and leaves the student the fullest liberty as to the choice and order of subjects and the amount of time devoted to them. It is thought that even one hour a day, if faithfully used, will enable a student to accomplish very much in the course of a year, and much more time can be devoted to it by those who have the leisure and the inclination. A serious drawback to success in this scheme is the lack of trustworthy text-books. Nevertheless, such a course of reading must prove stimulating and helpful when the text-book does not become a substitute for personal observation, but by dealing with and illustrating the materials and processes of every-day life on the farm is a direct encouragement to study the things themselves.

It is not probable that any finished gardeners will be turned out in a single term at Cornell, while a certificate, or even a diploma, from this novel Chautauqua would hardly pass current as a guarantee of high proficiency. There is little doubt, however, that the addition to ordinary business practice of a short college course or a systematic course of home reading would be of distinct value to any young man, or any young woman either, for the matter of that. Not only will such a schooling make better horticulturists, but it will enable a great many more young people to pay some attention to the scientific basis of the art of horticulture. What is most needed for a higher horticulture, and an improved agriculture as well, is a body of men devoting themselves to original investigation; and while these short courses will never equip men for such high service, they will help to enlarge the class from which such experts must be drawn. It is an impossible state of things to have a few trained and finished horticulturists in the country while the general average is extremely low. Men of the first rank in science and practice are not developed out of such conditions. There must be a constant gradation from the lowest to the highest, so that the more

persons there are who have some training, who realize its value and are ambitious for more, the more there will be to rise from this class by natural selection to the highest rank of skilled scientists. The broader the base of the pyramid the more lofty will be its apex. While these courses, therefore, are beneficial directly in the instruction which they give, they render a higher service by increasing the material from which the very best are drawn. The greater the number of good practical men we have in our farms and gardens, who are also keen observers and eager learners, the more there will be to rise to broader attainments in knowledge and superior skill in practice, and the more certain will be the supply of scientific students, experimenters and explorers of the first rank upon whose patient work the hope of our agriculture and horticulture must ultimately rest.

A German Pleasure-ground.

THE issue of *Gartenflora* for October 15th contains an interesting illustrated description of a peculiar pleasure-ground, called the "Rheinanlagen," which lies along the right bank of the Rhine at Coblenz. When the late Empress Augusta established herself at Coblenz in 1850, her husband, the future Emperor, being then Prince of Prussia and military governor of the district, the ground now covered by this park was chiefly waste land interspersed with hillocks and a few bits of meadow. Her attention was soon attracted by the neglected spot, with its beautiful views of the river, and through her efforts, and largely in accordance with her own ideas as to how it ought to be arranged, it was gradually transformed into the very pretty pleasure-ground of to-day. It measures nearly two miles in length, with an average breadth of only some four rods, some ten feet of which is absorbed by a towing-path skirting the water, for the convenience of the drivers and teams which must drag up stream the clumsy traffic-scows which drift downward with its current. This path, however, along the confines of the park has been handsomely built, and is much frequented by the public toward evening, when the tows have tied up and the opposite western shore of the stream is already in shadow. A small spot has also been reserved for the use of the military Pioneers, whose pontoon practice-ground is on an island near by. Nevertheless, skillful treatment has done wonders in beautifying this narrow strip of land. Its narrowness, of course, prevented any attempt at extensive plantations or large showy flower-beds. It was wisely decided to make its chief feature a long avenue running parallel with the Rhine. This avenue is planted along half its length with Lindens, and along the other half with Plane-trees and Chestnuts, and forms first a carriage-way for about one-third of the length of the pleasure-ground, and leads to a pretty restaurant, after which it is a foot-way lined with ornamental benches. On either side of it, as the width of the ground permits, are small and varied masses of shrubs and flowering plants.

At one end the confines of the ground are marked by a tall column, crowned by the imperial eagle, and at the other by the abutments of the railroad-bridge which crosses the river, masked by a thick group of trees. Near these is a pretty plantation of conifers and a little Rose-garden; and, as the pictures show us, architectural and sculptural adornments have been tastefully introduced at many points to vary the aspect of the grounds. Here we have two large arches, springing near the balustrade with rises above the towing-path, covered thickly with vines, and forming effective frames for the pretty picture made by a village on the opposite shore of the river. Then we see a projecting platform with a flight of steps leading down to the towing-path, and encircled by an iron railing, the piers of which, however, are of stone and bear charming little statues. And, again, at the edge of a luxuriant mass of shrubs stand four statues of children playfully simulating antique gods, which are connected by a low plinth that gives architectural effect to the intermediate flower-beds it encloses. There

are also a little observatory for those who are not satisfied by the perpetually changing and perpetually beautiful glimpses of the river which the ground itself affords, several prettily designed shelters, and an ornamental grove hidden away in a thick shrubbery, while occasional large trees give an air of dignity to the whole. Indeed, the newest portion of the pleasure-ground, laid out some fifty years ago, is covered with woods and naturalistic architectural decorations.

When one reads how much has been done on so narrow a bit of land as this, and how much refreshment and delight it gives to thousands of people, our own neglect of otherwise useless pieces of ground seems doubly regrettable. Of course, the close vicinity of the noble river plays a major part in the beauty of this garden; but we have hundreds of towns lying on the shores of fine rivers, and it seems as though in each and every one of them a narrow strip of ground might be secured, which, tastefully arranged, would be of priceless value not only to the appearance of the town but to the bodies and spirits of its population. No matter how small it may be, a spot can be made varied and lovely by an artist's hand and there are often better possibilities in a long, though very narrow, strip than in a square one covering an equal area, especially if it lies along the borders of a sheet of water. Even the fact that the water's edge must not be shut off from practical public service need not be a fatal blot on an adjacent pleasure-ground, as is shown by the example of the one which the Empress Augusta treated.

Notes of a Summer Journey in Europe.—XVII

IT is probably not too much to say that no private nursery or horticultural establishment in the world has done much for the advancement of horticulture, in all its branches during the last fifty years, as that of Messrs. James Veitch Sons, proprietors of the Royal Exotic Gardens at Chelsea and those at Coombe Wood. The fifth generation of the name have now entered the business, which is still carried on with all the energy and enterprise characteristic of the firm in the past and with a greater prestige than ever. The Veitches have been indefatigable as collectors, sending agents to all available parts of the globe where there was any chance of finding new plants for use or ornament. Members of the firm have themselves gone on these expeditions, and every active horticulturist knows of or has benefited by the collections of late John Gould Veitch, made in Japan and Australasia over thirty years ago. His son, now one of the young members of the firm, started last September for the countries and islands of the Pacific on a collecting trip, which is expected to last two years. The firm is not, however, merely known as collector and distributors of rare and new plants, for it carries on a system of hybridizing, cross-fertilizing, testing, etc., worthy of any horticultural school or specially endowed institution, and indeed, the results obtained are far ahead of many institutions of which this work would naturally be expected.

Besides the nurseries already alluded to, there are the grounds and nurseries at Fulham, Slough and other points, the traveler on the railway from London to Kew passes by on their stations at Turnham Green. In the matter of publications, too, the firm is not satisfied with perennial catalogues and price-lists, but has issued other publications which are valuable monographs to all cultivators. Among these the *Manual of the Coniferae* stands as an extremely useful hand-book of the cone-bearing trees in cultivation up to the time of its publication, eleven years ago; while the *Manual of Orchidaceous Plants*, cultivated under glass in Great Britain, now being issued in parts, is indispensable to every intelligent and progressive Orchid-grower, and even those who have only a general interest in these flowers will find much that is interesting and instructive.

The Royal Exotic Nurseries at Chelsea are the headquarters of the various branches, and the plants grown here are not those which require the protection of glass houses, of which there are considerably over a hundred given up to propagation and cultivation. Such a collection is too great to be fully appreciated in the course of two or three hours, but the traveler who comes here with a hobby for Orchids of any class, Nepenthes, Hippeastrums, Begonias and the gorgeous Japanese and other greenhouse Rhododendrons and Azaleas

re to be satisfied. A great many hybrids have been raised from these, some of them very beautiful. In the latter part of the month hybrids of *Rhododendron Javanicum* and others are showing good bloom. It is a characteristic of this class that they will bloom all the year round. They require considerable heat in winter, but otherwise they are very easily grown and require no unusual treatment. There are almost all colors and shades and combinations of colors in the flowers, while there are a number of good double forms. These *Rhododendrons* are generally considered more beautiful and more active than the *Camellias*, which are not neglected here. Great stocks of the most useful decorative plants are kept, and these must be seen to be appreciated.

The visitor especially interested in hardy trees and shrubs would do well to go to Coombe Wood, where there is a rich collection; even the ordinary sightseer or lover of things beautiful must derive a great pleasure in going about this beautiful country and in visiting a nursery so trimly kept and so filled with fine specimens of plant-growth. The nursery is largely situated in a road, sheltered hollow, and to look down upon this in June, when the *Rhododendrons* and many other shrubs are in bloom, must be a sight well worth going a long way to see.

Conifers are a specialty here, many of them having been first introduced into cultivation through this establishment. Among these are the beautiful *Abies Veitchii*, *A. Sachalinensis*, *A. brachyphylla*, the curious and interesting *A. bracteata*, *A. polita* and many others. Japanese Maples have been introduced in great variety, and there are some of the originally imported specimens, which have attained handsome proportions. [A. Veitchii, and perhaps others of the trees named above, had been sent to America by Thomas Hogg or his son before they were introduced in Europe.—ED.]

In such a climate as this, with winters so much milder than are accustomed to in southern New England, it is possible to grow a greater variety of shrubs out-of-doors, and plants in New Zealand and Chili and other temperate parts of the world thrive well. One of the most interesting and beautiful of these is *Eucryphia pinnatifolia*, a native of south Chili. It has proved quite hardy at Coombe Wood, its hardiness being attested by fine bushes eight or nine feet high, just out of the bloom borne during July and August. This shrub has deep shining green pinnate leaves of fine leaflets, and its flowers, which expand from two to three inches across, are composed of four broad white petals, numerous long silvery white stamens and reddish brown anthers. They strongly suggest large *Hypericum* or *Stuartia* blossoms. This would be a most desirable acquisition among shrubs for planting south of Washington. The species is, as yet, a great rarity in cultivation, and it is for their enterprise in making such plants better known that the fame of the Veitch establishment is largely due. Although the climate here is so much milder in the winter than in any part of New England, there are some disadvantages to offset the moderation. This is perhaps particularly the case with *Firs* and other plants from northern regions, which do not flourish well in this part of England, because the warm winters and early springs interfere with starting into growth too soon and with consequent injury by frosts, occasionally as late as June.

The raising of shrubs for forcing purposes has grown to be a large business here. Lilacs, *Viburnums* and *Azaleas* are grown in quantities and are superior to those imported from the Continent. A large number of small plants of the handsome Japanese *Tecoma grandiflora*, in pots, were coming into bloom in mid-September. Our *Fringe-Tree* (*Chionanthus virginica*) is grafted on the European Flowering Ash (*Fraxinus excelsior*) and is used as a pot-plant for forcing; thus treated it flowers beautifully in winter.

Plants of the true *Actinidia polygama* are growing here, but only ones of which I know besides those recently noticed in GARDEN AND FOREST (vol. v., p. 320), on the grounds of the cultural College at Amherst, Massachusetts, and which were brought from Japan by Professor W. P. Brooks. The beautiful silvery lustre which covers a portion of the leaves is an efficient means of identifying the species, and if further proof is necessary, it is to be found in the fact that at Coombe Wood much trouble is experienced from cats, which destroy the foliage within reach. The attraction which this plant has for cats is remarkable. A Japanese gentleman informed me in order to capture all the cats of a neighborhood, which was wild or Bohemian life, it was simply necessary to burn the leaves of the *Actinidia*, when all within range of the odor would be so effectually attracted as to be caught with the greatest ease.

The Messrs. Veitch do not confine their work to any one particular line of horticulture, but deal extensively in fruit,

vegetable, flower and other seeds, plants and bulbs, among which they carry on numerous experiments. Thus equipped with the best of material in all branches of the business, they are enabled to furnish an estate completely from their own stores, and as they also undertake all kinds of planting and landscape-designing, there are not a few English estates which are conducted entirely under their management.

Arnold Arboretum.

J. G. Jack.

Color for the Lawn in November.

ONE of the sorrows of winter is the absence of color in the landscape. It was this fact that led to the planting on the lawn, in a conspicuous view from our living-room windows, a *Hemlock-tree* as a background for the *Witch-Hazel* and *Waahoo*, which give late blossoms and bright berries. Together they make the prettiest imaginable group. The frost may come, the snow may fall, but all the cold white days we look into the heart of a little summer. The yellow stars of the *Witch-Hazel* twinkle and shine well into November, and the *Waahoo* berries hang on the boughs through the winter. They are both native shrubs, and thus are perfectly acquainted with our climate. They give great pleasure to the children of the household, who become quickly interested in what seems their untimely blossoms and fruit. In choosing plants and trees for the home lawn the children's interests deserve consideration.

The *Witch-Hazel* is a true witch among shrubs. It has a wild way of growth, several crooked branching trunks growing from the root, smooth leaves, four very long, linear petals, yellow and twisted or curled. So far it is not unlike other shrubs. The name *Hamamelis* indicates its most striking peculiarity, "flowers and fruit together on the tree." It blossoms in October and November, and the flowers of this fall will be the fruit of next fall, which hangs on the bare boughs when it next blossoms. The flowers, though small, are made noticeable by the manner of blossoming in clusters on the stem. The fruit is a woody capsule, nut-like, two-celled, and the seeds, almost black and shining, are the prettiest seeds in the world. Another peculiarity of this curious shrub is its explosive seed-scattering. Many years ago, wishing to secure a quantity of these seeds to make a necklace like one I had seen, it became a question how to get them. Before the nut was ripe enough to open, it was almost impossible to get at the seeds, and when the capsule opened they were shot out suddenly, scattered far and near and lost. A quantity of the almost ripe seed-pods were gathered, put in paper bags and hung up to wait and see, or rather to wait and hear, what would happen. For days those pods, as they dried, kept popping in the bags, and the seeds, small and polished, very like rice in shape, were secured. The explosive opening of the wild *Witch-Hazel* fruit may be known to all, but it is not very long ago W. H. Gibson, in "A *Witch-Hazel* Copse," tells of making this discovery after he was sure he knew everything about the *Witch-Hazel*.

But when the seeds were gathered there was another problem to be solved—how to thread them. The finest, sharpest needle would split them every time. The friend who had threaded them told me how it could be done. The seed was to be cut off at each end with a very fine file. This was a labor of love, and the necklace was pretty enough to pay the trouble. Like the flower, the leaves when ripe are yellow. To those who enjoy the autumn woods it is a very bewitching shrub, but never seems more witch-like than when seen against a bit of blue sky. The leafless branches, lifting up clusters of twinkling lights, have a fascination for eye and heart.

The *Waahoo*, *Burning Bush*, *Spindle-tree*, *Prickwood* or *Strawberry Bush* belongs to the *Staff-trees*. Perhaps it was early found out that a branch of the shrub made a good stout staff. Some of the numerous names have come from the uses to which the wood has been applied. The common name, *Spindle-tree*, came from the fact that in the days of spinning-wheels the wood of the European species was used to make spindles, and the name remains. Possibly the shrub is called *Prickwood* because the wood was used in making skewer-like pins, used to hold the dress together as late as the reign of Henry VIII., when metal pins became more general. The fine hard-grained wood is used for the finer articles of turnery, and was formerly used in making musical instruments. The European *Spindle-tree* is often grown in shrubberies, but it is in no way superior in beauty to our native *Waahoo*, with its interesting Indian name.

The *Waahoo* blossoms in June; the flowers are small and not particularly attractive. It is common enough all summer, but when the world is bereft of color, then the *Waahoo* is

in its glory. The bright crimson fruit, drooping on long peduncles, continue on the stems through the winter, as grateful to the eye as the Palm of the desert.

Hornellsville, N. Y.

R. M. T.

New or Little-known Plants.

The Chrysanthemum, Golden Wedding.

IT is the boast of American Chrysanthemum-growers that they are producing home-grown seedlings which average as good, or better, than importations from abroad, and yet we are still receiving varieties from Japan which are of conspicuous excellence. The famous Neesima collection of twelve plants, for example, not only contained Mrs. Hardy, which was then an entirely new departure, but such standard varieties as W. H. Lincoln, Mrs. Fottler, Kioto, Lillian Bird and others. Last year Peter Henderson & Co. imported a variety from Japan from which they secured three or four plants, which flowered in time to be exhibited at the Chrysanthemum show in Philadelphia, where it received a silver medal. It was happily named Golden Wedding, and at that time was described in this journal as a "flower of the largest size, high in the centre, with petals incurved and loosely twisted, while the outer ones are somewhat drooping and reflexed. It is a bold flower of uncommon form and great sturdiness in stem and foliage."

This year the plant has continued to show the same vigor of growth, and in the New York show it was the variety used in successful competition for the GARDEN AND FOREST cup for a vase of the best six blooms of any variety. It was the flower which also won the cup offered by Mrs. W. Bayard Cutting for a vase of fifty blooms of any given variety. It also received a premium as the best yellow flower at the same exhibition. It was again shown in Philadelphia, and, while not entered for competition, the judges pronounced it, in their judgment, the best yellow Chrysanthemum in commerce. We may add that while the flower has great size and substance, it has not a coarse line, and its color, while a pure yellow, is unusually deep and rich. The illustration on page 559 shows the character of the flower, but it does not give an adequate idea of its extraordinary depth. It is so double that it never shows an eye. A large vase in which a number of these flowers are loosely arranged on long stems makes a decorative object of most striking character.

Foreign Correspondence.

London Letter.

CONIFERÆ.—The most successful, and, in some respects, the most important of the various conferences or plant congresses arranged by the Royal Horticultural Society was that devoted to Coniferæ, and which was held at Chiswick in October of last year. The report of the proceedings, which forms Volume XIV. of the Journal of the Society, has just been published. It fills nearly six hundred pages, and is made up of papers contributed by specialists, both scientific and practical, who are eminent authorities on Coniferæ. The botany and scientific aspect generally of the order are dealt with by Dr. Masters, Professor Carl Hansen, Professor Marshall Ward and Mr. W. F. Blandford, the economic and decorative value of the order being treated upon by Mr. H. Veitch, Mr. G. Nicholson, Mr. Malcolm Dunn, Mr. E. J. Baillie and others.

The list of Conifers and Taxads in cultivation in the open air in Great Britain and Ireland by Dr. Masters, F. R. S., fills seventy-seven closely printed pages. The *Genera Plantarum*, of Bentham and Hooker, has been followed as the standard authority for the generic names, and for the species, De Candolle's *Prodromus*, "but with considerable modification." This list will, no doubt, become the recognized authority for the names of Coniferæ, in England at any rate. Of Professor Hansen's paper on the Conifers of Denmark, Dr. Masters, who is the first Eng-

lish authority on Coniferæ, remarks, "nowhere is there collected together so much interesting information as in this paper of Professor Hansen's."

"The Diseases of Conifers," by Professor Ward, is a most valuable contribution to the literature of this order. The same may be said of the whole of the papers which deal with the more practical questions, such as planting, the value of Conifers in the garden, etc. Although called a "Report," this volume is really an encyclopedia of information on Coniferæ, and should be in the possession of every one interested in this most important family of plants.

NEPENTHES.—A well-grown collection of these plants is a most attractive as well as interesting feature in a garden. Unfortunately, it is only in very warm houses and with otherwise exceptional conditions that such a collection is attainable. Messrs. J. Veitch & Sons, of Chelsea, have made *Nepenthes* a specialty for many years, and their collection now is an exceptionally rich one. They have raised numerous hybrids, among them being the best of all *Nepenthes*, species or hybrids, *N. Mastersiana*. A collection of thirty kinds, all beautifully grown and laden with fine, well-colored pitchers, was exhibited by them at the meeting of the Royal Horticultural Society held this week. There were no less than thirteen species among them—*N. Burkei*, *N. Rafflesiana*, *N. sanguinea*, *N. distillatoria*, *N. cincta*, *N. Veitchii*, *N. Northiana*, *N. Curtisii*, *N. albo-marginata*, *N. bicalcarata*, *N. hirsuta*, *N. ampullaria* and *N. stenophylla*. Besides these the best of the hybrids were represented together with a new hybrid, raised by Messrs. Veitch from *N. Northiana* and *N. Curtisii*, and to which they have given the meaningless name *N. Northisii*. It is a beautiful plant, and if it only inherits the constitution of *N. Curtisii* it will become a favorite in gardens. It has broad leaves, the pitchers of the same size as those of *N. Northiana*, and colored better than either of its parents, being nearly yellow, with numerous large crimson blotches and rim. I have never seen a more creditable collection of *Nepenthes* than these.

PANDANUS BAPTISTII is a new plant recently introduced from New Caledonia to Kew and elsewhere, and exhibited this week by Messrs. Veitch. It was shown in the summer by Messrs. Sander & Co. under the name of *P. Dyeriana*. When the Kew plant arrived from Australia it had gracefully arching leaves colored glaucous green and striped with cream-yellow. Under cultivation here, however, it has lost the clearness of its variegation, although the lines, now yellowish green, are still present. If it can be grown to assume the color it had when first imported it will probably become a favorite plant for table decoration. It is, I believe, only a variegated form of *P. inermis*, a well-known variety in botanical collections, and which is remarkable in having elegant channeled glaucous green leaves a yard long and one and a half inches wide, with spineless margins. The absence of spines distinguishes this species from all other garden Pandani. According to some authorities *P. inermis* is the same as *P. lævis* of Rumphius.

CYMBIDIUM WINNIANUM.—This is the best hybrid *Cymbidium* yet raised. It is the result of crossing *C. eburneum* and *C. giganteum*, the latter the seed-bearer, and was raised by Mr. C. Winn, of Birmingham, a well-known amateur grower of Orchids. The plant, which bore five racemes of flowers, is like *C. eburneum* in foliage and habit, and also in the length and curve of its flower-spikes, each of which carried about a dozen flowers nearly as large as those of *C. giganteum*, and colored cream-yellow, with spots of red on the labellum. The plant was exhibited by Messrs. F. Sander & Co., and was awarded a first-class certificate.

SPATHOGLOTTIS VIELLARDII, var. RUBRA.—This is a rich-colored variety of a pretty free-flowering stove Orchid introduced about ten years ago from Polynesia by Messrs. Linden, and at first called *S. Augustorum*. The type has broad plaited leaves and an erect stout scape, two or three feet high, bearing a cluster of whitish *Phalænopsis*-like flowers, which spring from among numerous boat-shaped green bracts. The variety, of which a plant was exhibited

this week by Sir Trevor Lawrence, has rich rosy purple flowers with a deep blood-crimson lip, and is altogether more attractive than the type, good Orchid though this is.

CATLEYA LEUCOGLOSSA is a beautiful hybrid of Veitchian origin, the parents being *C. Loddigesii* and *C. Fausta*, the latter a hybrid between *C. exoniensis* and *C. Loddigesii*. In the soft blush-lavender color of its well-formed flowers and the white front lobe of the labelum this new hybrid has quite exceptional attractions. It is what all garden hybrids should be, a plant which, while combining all the good qualities of its parents, is superior to both. It obtained a certificate.

DENDROBIUM STRIATUM is a Veitchian hybrid of somewhat remarkable parentage, having been obtained from *D. Japonicum*, one of the smallest, and *D. Dalhousieanum*, one of the largest of all Dendrobes. It has rosy flowers not unlike those of *D. nobile*, with a curiously formed lip. It cannot be called an acquisition to garden Dendrobes, though as a hybrid it is probably of special interest to morphologists.

NEW CHRYSANTHEMUMS.—The following were awarded certificates at the last meeting of the Royal Horticultural Society: *W. H. Atkinson*, a fine Japanese variety, described in my last letter; *Vesuvius*, also Japanese, a good decorative flower, large, of good substance and form, its color rich orange; *Golden Ball*, a golden yellow Japanese variety of medium size, raised in the centre, the petals drooping. It is said to be free and a promising plant for cut flowers; *Emily Doone*, Japanese, a large flower, white, the outer petals tinged with rose, the central ones creamy yellow.

Mr. Cannell, of Swanley, sent a tray of twelve magnificent blooms of last year's best production in the way of new Chrysanthemums, *Viviand Morel*, which is a great improvement on the older *Etoile de Lyon*. He also exhibited twelve fine blooms of one of the very finest of all Chrysanthemums, *Colonel W. B. Smith*, which, I believe, we owe to your Mr. Spaulding. It is as grand among the golden-colored varieties as *E. Molyneux* is among the crimsons.

London.

W. Watson.

Entomological.

The Oak-pruners.

THROUGHOUT the month of September there were noticeable along the roads in parts of New Jersey and Pennsylvania, broken and dying twigs and branches on Oaks of all species and of all sizes. These became more numerous and prominent as the month advanced, and what was at first regarded as an accident, or as a consequence of the anthracnose, so abundant during the year, proved on investigation to be the result of insect attack, and of an old offender at that. The first noticeable sign of injury was a premature coloring of the leaves; the first high wind snapped the dying branch, often leaving it suspended by a few fibres, dead and dry, until a heavier wind brought it to the ground. An examination of the fallen branches at this time shows that the broken end is clean cut, except for the bark, and that there has been a deliberate girdling from the centre outward, leaving only the bark and a few wood-fibres intact to prevent immediate breakage. In the very centre will be seen, on close examination, a little plug of wood cuttings deceptively resembling plant-pith, and if this is lifted out a smooth hole about an eighth of an inch in diameter is disclosed. If the branch or twig be then

split there will be found, at a distance of from one to two inches, another plug of shavings, and, an inch or more beyond, yet another, or sometimes there will be the end of the gallery. Lying in the burrow between these last plugs, or between the second plug and the end, there will be found a rather deep yellowish larva, with small brown mandibles and a considerably enlarged head and thoracic segments. In this burrow the larva rests quietly during the winter, changing to a pupa in spring. In this pupa all the appendages of the future adult are separately encased, and we readily recognize it as a long-horned beetle, which, when it finally matures, proves to be a species of *Elaphidion*. Two, if not three, species are engaged in this destructive work. All are very much alike, of a chestnut-brown color, sparsely irrorate with pale hair, massed into a more definite pattern on the elytra. The forms of the larva, pupa and imago are very well shown in figure 94.

Ordinarily, the insects are not very abundant, though scarcely rare, and their injury amounts to a somewhat haphazard, and by no means severe, pruning. Even in seasons like the present, where the insect has appeared in unusually large numbers, the pruning is not really excessive; but on shade and ornamental trees it is sometimes scarcely judicious, and, occasionally, decidedly disfiguring. In some of the broken branches, two or even three larvæ were found at short intervals; but there is rarely more than one attempt to girdle. How do the larvæ nearest the extremity of a branch know that there is another, nearer the base, who will attend to severing it? I have also bred the beetles from young Oak stems and trunks as well as branches, the burrows in one case extending beneath the surface. In no instance did any of these trunk-borers make any effort to girdle, though they gave out exactly the same species bred from larvæ that had girdled branches.

I have not been able to satisfy myself whether or not the

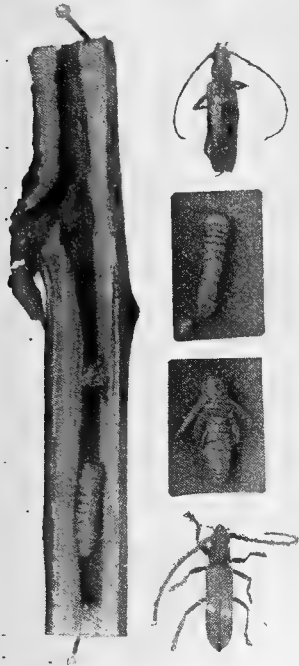


Fig. 94.—Larva, pupa and imago of Oak-pruner.

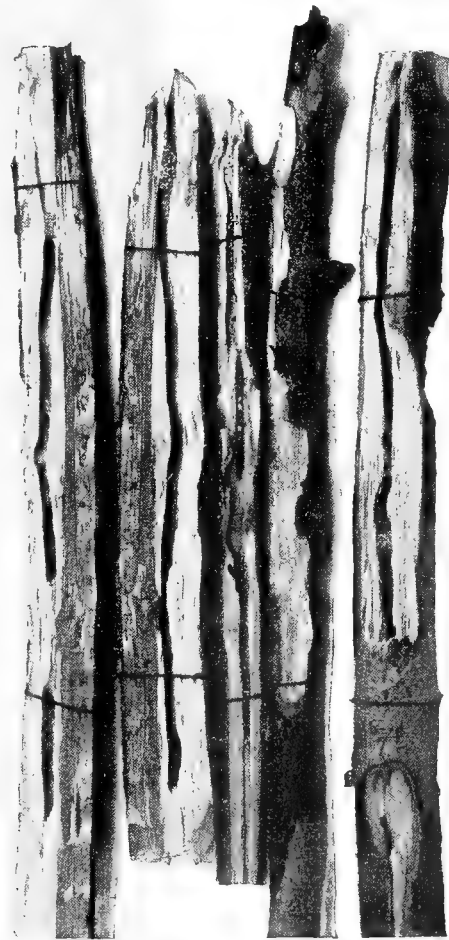


Fig. 95.—Burrows of *Elaphidion* in branches of scrub Oak.

insects usually, or preferably, attack healthy rather than dead or dying wood. It sometimes seems as if they did; but it is certain, also, that they very freely attack diseased or injured branches. In an Oak-brush, through which a fire has run one year, these larvæ will be found in great numbers the year fol-

lowing. In Fig. 95 are shown specimens of the work of the larvæ in a burnt scrub Oak

When these insects have been abundant, the fallen branches should be gathered and burnt during the winter; this will, of course, destroy the larvæ contained in them. When infested Oaks are near orchards this course is imperative, because the insects also attack Apple and other pomaceous fruit-trees.

Rutgers College, New Brunswick, N. J.

John B. Smith.

Cultural Department.

Top-grafting Apples.

THERE are few questions in orcharding so unsettled as that of the effect of the stock upon the cion. In root-grafting and nursery budding it is pretty generally conceded that the effect is nil, or nearly so; but when it comes to grafting or budding on the branches of bearing trees, the general opinion seems to be, among ordinary observers, that some effect upon the size and quality of the fruit may take place. To determine such a question with entire accuracy manifestly would require much more careful, systematic and long-continued tests than we have any account of. I am sure it would be profitable to have a long series of experiments carefully made at some of our agricultural college farms with a view of settling the matter, as in commercial orcharding, especially, it may often be that a right decision would be of large pecuniary importance.

Some of the claims made in regard to these effects have been manifestly untrue. Millions of nursery trees have been sold through our extreme northern states which were stated to be made entirely safe against winter-killing by being grafted upon Siberian Crab stocks. This pretense has disappeared, and the trees sold under it have disappeared almost as soon. Not only were the grafts no hardier, but the Crab stocks proved very short-lived, and, of course, the tops could not survive the roots, even when they were themselves of iron-clad varieties.

I am led to discuss this topic just now by noticing in a report of the Canadian Horticultural Bureau a question put by a member of the Committee of the House of Commons on Agriculture and Colonization to Mr. John Craig, horticulturist in charge of the Dominion Horticultural Experiment Stations at Ottawa. This question was: "If a winter Apple is grafted on a summer Apple, what is the effect?" Mr. Craig's reply was: "The theory is, that it hastens the ripening season and lessens the keeping qualities." But there was no evidence that Mr. Craig indorsed this "theory"; and in my own fifty years of observation and experience in fruit culture I have never seen any conclusive evidence that such an effect had been produced.

Now, this is by no means saying that no effect is produced by such grafting. We are all aware that the grafting or other working of Apples upon the Paradise or Doucain stocks, and of Pears upon Quince stocks, has a decided effect in causing early fruiting of the grafts—usually attended, or followed, by a decided abbreviation of the life of the graft, unless it is so deeply planted as to prevent it from throwing out independent roots of its own. This knowledge is quite in line with what has been referred to above as the result of grafting our common Apples upon Siberian Crab stocks. The life of the graft can be no longer than that of its stock.

It has often been noted and recorded in our journals and books of horticulture that the fruit grown upon trees dwarfed by such methods is often larger and finer than the average of like fruit in ordinary standard orchards. But while this is indisputable, an unsafe conclusion can easily be drawn from it; for with the ordinary orchard culture it will be found that the dwarfed Pears and Apples prove much inferior to those on standard trees; clearly showing that, other things being equal, the dwarfed trees are really of inferior value.

The Doucain stocks being not conveniently attainable, I have for a considerable time been making use of the well-known Tetofsky, one of the first Russian Apples introduced into this country, as a substitute. This variety is not strictly a dwarf, for in rich soil the Tetofsky makes a large tree. Besides this, it is not itself an extremely early bearer; but having about a dozen of them in a row along with a single tree of another Russian—Prolific Sweeting—and finding the last much the most desirable Apple, I top-worked it upon the Tetofskys. The result has been remarkable as well as instructive. The original Prolific Sweeting was received as a single cion from the United States Bureau of Agriculture in 1870. It was root-grafted and has made a fine growth, and is now a large tree, but it has never grown anything like a full crop. Quite different has been the case with its cions worked in the

Tetofskys. They have borne immense crops of very fine apples, finer as well as so much more numerous; but these grafted trees have made but a slow growth, though quite healthy.

Now, here seems to be a very plain case of influence of stock upon cion, nothing very new, because quite in line with our knowledge of what happens when we graft upon Doucain stocks, though in the latter case it is usually done at the crown, while my Sweetings were worked into the branches of Tetofsky.

Influenced by this interesting experience, I have recently been setting a considerable number of Tetofsky-trees, with the view of using them as stocks upon which to work tardy bearers of otherwise desirable Apples. For this section, particularly, the Bethel Apple has shown a very high degree of merit as a commercial fruit, being for the "cold north" very much what the Northern Spy is farther southward—large, handsome, and an excellent keeper of very good quality for all uses. It is, by its looks, quite plainly a seedling of Blue Pearmain, but oval instead of oblate; an excellent bearer, but tardy in beginning to bear.

It just now occurs to me that this use of Tetofsky as a stock might be easily and profitably extended to regions other than our "cold north" for varieties that one must plant chiefly "for his heirs," if grown in the ordinary way. Why not use it for the Spy, for instance? I leave this thought with careful readers; but I must be permitted to say to them, too, that I have neither cions nor trees of Bethel for sale, as it is my experience that this may save much unprofitable correspondence.

Newport, Vt.

T. H. Hoskins.

Basket-plants for Conservatories.

MANY attractive changes of arrangement may be made in the conservatory by the judicious use of plants specially adapted for basket-culture, of which there are both foliage and flowering plants enough to give ample variety. And as the object is to display the charms of the plant it is not necessary that the basket shall be any elaborate affair of rustic work, appropriate as these undoubtedly are for certain purposes, but a simple wire basket; such as the old-fashioned ox-muzzle, or those shaped like a basin will answer the purpose fully.

In filling these baskets it is necessary to line the frame with moss, to keep the soil in place; either live sphagnum or green flake moss from the woods is suitable material, and generally any ordinary potting soil will answer as a compost. Proper attention must be paid to the watering of basket-plants, for being exposed to the air on all sides, they naturally dry out rapidly when well established; it is advisable to give them a dip in a tub of water occasionally, in order to insure their thorough watering.

Begonia glaucophylla scandens deserves more general recognition for basket use. It is the finest of its family for this purpose, being handsome in foliage and almost always in flower. *B. glaucophylla scandens* is a strong-growing species. I have seen it with shoots fully three feet long, making a perfect screen around the basket. The tips of the shoots are well clothed with an abundance of coral-red buds and open flowers of a lighter shade. As with all *Begonias*, the propagation of this species is very easy; some shade is needed to secure a rapid growth.

An admirable group of basket-plants is also found in the *Æschynanthi*, and also a somewhat uncommon one, at least in our American collections, though grown in some commercial establishments of this country at least twenty years ago. The *Æschynanthi* form a part of the *Gesneraceæ*, and consist of a number of species of more or less scandent plants with small opposite leaves of fleshy texture; the flowers are formed at the tips of the shoots and from the axils of the leaves, and are tubular in shape and usually bright-colored. These plants require a warm house and plenty of light to make them flower freely, though a slight shade is beneficial in the summer in preventing scorching. A light rich soil is best, and should be very porous. The addition of some rough lumps of peat and pieces of charcoal give the best results, and during the winter a comparatively small quantity of water will be required. Among the best species are *Æschynanthus fulgens*, *Æ. Lobbianus*, *Æ. splendidus* and *Æ. pulcher*, the flowers of the first-named being crimson with an orange throat, while those of the other three are various shades of scarlet.

Episcia Chontalensis, perhaps more readily recognized under its older name of *Cyrtodiera Chontalensis*, is another useful member of the *Gesneraceæ* for basket-culture, and has slightly hairy leaves from two to three inches long, purplish on the under side and green above, the flowers being lilac, with a

white centre. This is a shade-loving plant, and needs no special attention if grown in a temperature of sixty degrees.

The *Torrenias*, also, are admirable plants for this purpose, *T. Asiatica* being the most scendent in habit, and producing its four-lobed flowers of purple and white in the utmost profusion, an abundance of water and plenty of light being the essential points of culture. During the summer months there

The Cultivation of Cattleyas.

LOOKING backward forty years, in the garden literature of that period, nothing is more striking, when we compare them with the periodicals of to-day, than the absence of Orchid notes. Collections of these plants were unknown outside of a few botanical gardens, and their cultivation was so



Fig. 96.—New Chrysanthemum, Golden Wedding, reduced one-third.—See page 556.

are few more showy objects in the conservatory than some well-filled baskets of *Achimenes*, the tubers of which should be started beforehand, and then planted around the sides of the basket. By this method a complete mass of foliage and bloom will ultimately be secured, providing warmth and moisture and some shade are given.

Holmesburg, Pa.

W. H. Taplin.

little understood that the plants rarely lived long. Now that we adopt a more rational system, the majority of plants can be made happy for a number of years, if not an indefinite period; for, while it is possible to grow *Cypripediums* for all time if their wants are supplied, the same is not true of some other genera and species, and cultivators well know how difficult it is to maintain in vigorous health some of the Cat-

tleyas, Dendrobiums, Phalænopsis and others. Rapid communication with the tropics has made the importation of Orchids much easier than ever before, and it is now possible to purchase, at a low price, within the reach of all, fresh imported plants that, with ordinary care, will start to grow at once, and should flower within the first year of their growth here. We have an admirable climate for the culture of Orchids in America, with a most suitable material at hand to grow them in, that is, the fibrous roots of the ubiquitous *Osmunda*.

The season of importing Orchids is now here, and a few remarks on treating *Cattleyas* may be useful to those who may wish to grow a few of the more popular kinds, such as *C. Trianae*, *C. Percivalliana* and *C. Mossiae*. All *Cattleyas* are kept dormant during transit here by lack of moisture, and the consequence is that directly the plants are received and placed in a genial atmosphere of 60 to 65 degrees, with moisture supplied by syringing once a day, they will commence to put forth roots in a very few days, and it is well to anticipate this by potting them as soon as ever they show signs of growth, using pots half-filled with crocks, just large enough to contain the bulbs, and the new ones that are about to be made the coming year. If all goes well, the pots will be full of roots in a year and need more root-room, and this is preferable to the use of pots too large at the outset, for the plants will never thrive if over-potted, or if a quantity of organic matter be placed about the roots. Good Fern-root, combined with a little sphagnum, is the best material to use in potting. The sphagnum is not necessary to the plant's well-doing, but is an excellent index to the condition of the plant as to moisture and a reminder when to apply it. All Orchids should be potted firm in the beginning, and to make sure of this stakes should be used to secure the plants, that when they make roots they will not be broken or injured by oscillation. These stakes may be removed when roots are formed, as these soon attach themselves to the pots and keep the plant firm. A night temperature of 65 degrees will suit newly imported plants, but for those established 55 degrees will not be too low as a minimum. All plants of *Cattleyas* that have finished their growth for this season should be kept a little drier at the roots than when in active growth, though it is never advisable to keep *Cattleyas* quite dry for any long period, or the bulbs will shrivel and lose vigor and the flowering period will not be such a gay one.

Plants of the old *C. labiata* will now have passed flowering. This is one of the finest of all winter-flowering Orchids, being exceedingly vigorous, a free bloomer, with a large percentage of good varieties; but its chief merit is that of flowering at a period when so few other showy kinds are to be had in bloom. After flowering the plants should be kept quiet, for it must be remembered that this plant takes its rest after flowering instead of before, as in many other kinds. The most perplexing feature of newly established *Cattleyas* is the way they have of starting to grow in and out of season, or just when they please. I have often been puzzled to know what to do with plants that start into growth when the resting period is at hand. The cause seems to be excessive vigor, and after a season or two, under good treatment, the plants settle down to a regular succession of rest and growth, which is a most desirable condition of things.

All *Cattleyas* should have the full benefit of the sun at this time of year; the foliage will become well ripened by its influence, and less moisture in the atmosphere is required while the plants are at rest for the next three months. The time to repot *Cattleyas* varies with the variety or species. We have recently potted plants of *C. Jaskelliana* that had begun to root freely, as these do not flower until next summer, but the majority of kinds may safely be repotted soon after they begin to push forward young growth in spring. Many kinds are rooting freely now, but it would be unwise to disturb them just previous to their flowering.

South Lancaster, Mass.

E. O. Orpet.

Agapanthus umbellatus.—Two centuries have elapsed since this grand plant was first brought to Europe from the Cape of Good Hope, and in that time it has steadily made its way until it has become indispensable to every important floral establishment in the world. Commonly called the Blue African Lily, it is immensely popular with all classes of cultivators, the rich as well as the poor. It is a plant of elegant habit, with large fleshy roots, and deep green strap-shaped leaves, which are upward of two feet in length when fully developed. The slender scapes are erect, about three feet high, bearing large umbels of bright, sky-blue, spreading flowers, each an inch and a half in diameter. The flowers appear most profusely during late summer and in early autumn, but

the season may be prolonged even to the verge of winter by giving liquid manure about twice a week when the plants show signs of exhaustion.

There is no better plant for the piazza, and it may be safely wintered in a dry, frost-proof cellar. Rich, sandy soil—loam, well-decomposed cow-manure and sand in equal mixture—ample drainage and, in the growing season, plenty of water are the chief accessories to its successful cultivation. The plant may be dried off in winter, but it should not be disturbed at the root very often, unless it is desirable to increase the size of the specimen. Pot-bound plants flower most freely, and they are easily kept in luxuriant health by supplying fertilizers in liquid form. Its management is, of course, simplified where the grower has a greenhouse at disposal, and it will yield a greater amount of pleasure in such places, but no one needs to be deterred from adding it to his collections of dwelling-house plants, as a greenhouse is not at all necessary to its perfect well-being.

There are several varieties of *A. umbellatus* in cultivation. Of these may be mentioned *Albiflorus*, producing white flowers; *Maximus*, in every respect more robust than the type; and *Variiegatus*, with green and white foliage. All these are desirable and very decorative, but the old-fashioned species is perhaps more reliable than any of the others. It is readily propagated by division.

Thunbergia erecta.—This plant, formerly known under the generic name *Meyenia* (a genus now incorporated with *Thunbergia*), is one of our prettiest stove shrubs. It was introduced in 1856 from Africa, where it inhabits the region of Cape Coast Castle. The habit is graceful, though extremely bushy where the branches are occasionally pinched and pruned. These operations are, indeed, necessary for the production of a neat specimen, for the plant is naturally a loose, rambling grower. The ovate leaves are small, opposite, and of bright green color, the larger ones generally dentate. The flowers appear singly at the axils of the leaves, on short, slender peduncles. The curved tube is white, orange inside, and about an inch and a half long, the limb of five spreading segments two inches in diameter, and of a charming blue-purple color. The plant is scarcely ever out of bloom; but it flowers most freely during the winter months, being then densely covered with its rich-colored blossoms from top to bottom. It is unfortunate that the flowers are not fit for cutting, and even on the plant they last but a short time. This, however, is the one weakness of all the *Acanthaceæ*, the order to which the *Thunbergias* belong.

Good flowering specimens of *T. erecta* are soon obtained from cuttings of the young wood, for it is a rapid grower under favorable conditions. They may be quickly rooted in sand, with the aid of a little bottom-heat, at any time of the year. The plant likes a strong, moist heat, and a compost in which rich sandy loam predominates. *T. erecta alba* is a beautiful white-flowered variety—a plant quite as attractive and useful as the species, and requiring precisely the same treatment.

Clerodendron fallax.—This is a stove-shrub of bold appearance and exceedingly decorative. It belongs to the bushy section of the genus, as distinguished from the climbing species, and is a native of Java. It is of erect growth, and makes a shapely plant from three to four feet high. The branches are well furnished with large, opposite, cordate leaves, deep green in color, and the brilliant scarlet flowers are borne in dense terminal panicles from six to nine inches in diameter. All the parts of the flower, except the brownish tinted anthers at the top of the conspicuous curved stamens, are of the same bright color; the spreading corolla, divided into five oblong segments, is irregular in form, and almost two inches across. The flowering season begins in August and draws to a close about Thanksgiving. The plant should be cut down to within two or three joints of the previous year's wood immediately after the flowers have faded, and be kept rather dry in an intermediate temperature during the winter months. A little larger supply of water may be given in early spring until the shoots show signs of pushing forth; the plant may then be turned out of the pot, the greater portion of the old soil removed from about the roots, and repotted in a mixture of strong turfy loam, fibrous peat and thoroughly decayed cow-manure, in equal parts, with a little sand added. It should then be placed near the glass in a moist house, the temperature of which is never allowed to fall below sixty degrees, and encouraged to grow. Liquid manure should be given two or three times a week after the flower-buds appear. This will aid considerably in the formation of large panicles. The plant should be syringed frequently in summer to keep down the red spider, and shaded

during bright sunny weather. It is easily multiplied by removing some of the short young growths, with a small portion of the older wood, in early spring, inserting them in the sand of a propagating-bench and shading until rooted, when they may be managed in the same way as older specimens. Young plants grown in this manner will flower during the ensuing autumn if confined to a single stem. Seeds of *C. fallax* are sometimes obtainable, and good flowering plants may be had from them in two years. They should be sown in spring, using sandy soil, and placed in strong heat until the plants appear. Pot them off singly when large enough to be handled without much trouble, and treat them afterward like plants raised from cuttings, pruning the stem to a couple of nodes above the soil in winter.

Cambridge, Mass.

M. Barker.

Begonia decora.—This is a new species of *Begonia*, and one which is likely to become a favorite in gardens because of its prettily marked leaves. It was found in Perak by Mr. C. Curtis, who sent it to Messrs. J. Veitch & Sons, Chelsea, by whom it was exhibited at the *Begonia* Conference last August under the name of *B. barbata*. This latter name, however, belongs to a well-known and common Burmese species, of which plants have been in cultivation at Kew since 1886, when seeds of it were sent home by Mr. C. B. Clarke, F.R.S. *B. decora* has a short fleshy stem crowded with leaves, the petioles of which are four inches long, and the blades obliquely ovate-serrate, not lobed, and five inches long by three inches in width. The whole plant is covered with a soft pubescence, giving it a velvety feeling, and the leaf-blades are colored a bright coppery red, with conspicuous veins of yellow-green. The flowers are pink. The plant appears to require stove treatment.

Kew.

W. W.

Correspondence.

California Oranges and Lemons.

To the Editor of GARDEN AND FOREST:

Sir,—I have been spending the first week of November among the orange and lemon growers of southern California, and I am greatly interested in the more recent features of Citrus culture. Without instituting any odious comparisons with Florida, the only rival Orange state, I cannot help feeling that the well-directed energy and intelligence of the horticulturists in the colonies I have been visiting can hardly be surpassed in any other part of America. I look upon Riverside, Redlands and the San Bernardino country generally as fairly typical of the most advanced Orange treatment in California; nearer the coast, at Santa Paula, Ventura County, the culture of the Lemon is as well understood as anywhere else in the state. Everywhere in the great Citrus fruit districts that I have studied a far higher ideal prevails now than ten years ago; the fascinating industry is becoming permanently established by highly educated specialists who love their work.

Twenty years ago there was no one in California who really knew much about Citrus fruits. A few families of small means founding colonies, under great difficulties—social, legal and physical—obtained water for irrigation and began experiments. When their efforts had fairly created a new industry the inevitable era of land-speculation set in, and dotted many a rich valley with mushroom towns. Thousands of promising young Orange-groves were neglected; progressive horticulture received a check; the weeds often grew waist-high in orchards where the land-boomer had driven his town-lot stakes. As this craze died out, the solid towns grew faster than before, and the tide of investment flowed back upon horticulture. The last five or six years have witnessed a marvelous development, especially in the Citrus fruits, which appear to belong more and more to certain districts, and to be more and more the specialty of certain families and colonies.

The true limits of successful Orange culture, long loudly quarreled over, are being settled by the simple commercial test—the sale of products in the open market. Details of culture—problems of stock, planting, pruning, and all that—are discussed daily, and almost hourly, in the Orange districts. Active organizations, with committees in every department, watch the whole world for news about orange matters, and are prepared to act as a unit. Every new variety is tested; all that skill and money can do to raise the standard of the product is constantly being done in such districts as Riverside.

Observe, for instance, the present behavior of Riverside respecting the frost question. The valley has about 50,000 acres under irrigation pipes and ditches. The annual planting of Citrus fruits is between 3,000 and 4,000 acres. Some winters

the temperature falls so low that the oranges are injured or destroyed. The meteorological record shows that the minimum temperature during the past ten years at the town of Riverside has once fallen to twenty-one degrees, once to twenty-five degrees and twice to twenty-six degrees. The lowest was ruinous to much of the fruit, and the others injured fruit in some orchards. The sensible Riverside horticulturists, instead of denying all this, are facing it, confident in their own ability to conquer the difficulty; they are using appliances for warming the orchards on a large scale. Their experiments show that the temperature can be raised from four to ten degrees by the use of fires. The moment that the thermometer falls to the danger point electric-bells can be rung and tanks of crude California petroleum can be lit. One gentleman has fitted up an eighty-acre orchard at a cost of \$10,000 or \$12,000. He claims that his grove is now absolutely protected, and that the running expense will be very little. Since his crop is worth \$50,000, and since a single night such as the freeze of 1891 would destroy every orange, the wisdom of the system is manifest. Other growers use coal-oil cans, filled with kindling-wood and coal, and placed in the orchard at the rate of from eight to twenty-five per acre. Some provide themselves with two-gallon iron kettles, and use reduced petroleum, costing in Riverside about ten cents a gallon. Ten dollars per acre will pay for the plant and the expense of one night's burning. Progressive horticulturists in other Citrus colonies are following in the track of Riverside, and preparing for future "cold snaps."

Thousands of writers have described in magazines and books the beauty of the more famous Orange colonies. While the stranger feels this first, there is, I notice, a broader and more fundamental fact about such places as Riverside. The whole community throbs with one purpose. The most wisely directed horticultural skill is continually at work bringing forth, through vast toils, new achievements. Each new tract planted requires in some degree special treatment, according to slope of hill, currents of wind, altitude or variations of soil. What fine hereditary knowledge of their art the orange-growing grandchildren of these Riverside pioneers may hope to possess!

The Lemon, long scorned in California, begins to receive much attention. N. W. Blanchard, of Santa Paula, grows the Eureka, the Lisbon and the Genoa. He has a large sweat-house, and produces a lemon that compares very favorably with the best imported. He cannot supply the San Francisco demand, and is planting 400 acres more. The trees are allowed to trail their lower branches on the ground, and seem far more picturesque in growth than Orange-trees. The fruit is cut when at the desired size, and while still green, so that one seldom sees a yellow lemon in the entire grove. In the older Orange colonies of southern California the Lemon is rapidly rising in favor, and large orchards will be planted the coming season. Villa Franca, Sicily and Lisbon are the varieties generally chosen. The best Sicily lemon is the Royal Messina, a recent introduction.

Berkeley, Cal.

Charles Howard Shinn.

Pedigree Seedling Chrysanthemums.

To the Editor of GARDEN AND FOREST:

Sir,—I am not altogether satisfied with the results of my experiments in raising pedigree seedling Chrysanthemums. I started three years ago with the settled conviction that John Thorpe was right. I have watched every little detail. I noted all the first seeds to germinate, and found, contrary to the general idea, that there was as great, if not a greater, percentage of good double flowers among them than those germinating later. Against the recommendation to discard weak seedlings, I have saved some for testing, and the majority gained vigor and produced a good percentage of fine flowers. When pollenizing, I found that full double flowers had a greater percentage of trifurcate stigmas than flowers in which the disk florets predominated; that the seedlings from these flowers were mostly tricotyledonous, and what is still more important, that all these seedlings produced full double flowers. Ligulate florets produced seedlings which maintained in a marked degree the characters of their parents, however much they diverged in color. V. H. Halleck was not influenced by any other color-cross than yellow, and all seedlings from it were either flesh-pink or yellow. On the contrary, it impressed itself upon all others. I have observed a tendency to earliness in all varieties; early varieties produce yet earlier seedlings, even when crossed by late varieties, and taking their character in other respects. For instance, E. Molyneux, early crimson, crossed with Walter Hunnewell, late orange, gave all early seedlings and mostly yellow. Goldfinder, late yellow, × L. Boehmer, early

pink, gave an early pink-flowered variety, with Goldfinder's peculiar character of flower. Violet Rose dominated all it came in contact with, but produced no seedlings itself of any distinct value. It was not always the strongest variety which made the greatest impression. Mrs. Alpheus Hardy showed its influence upon all it came in contact with—some very distinct varieties producing pure white spiny flowers. The pure incurved Chinese completely dominated the Japanese. Louis Boehmer \times Belle Pointevine, white, gave a first-rate white incurved flower; and by a yellow incurved, various shades of yellow and bronze, all incurved, and very few spiny. The incurved forms, on the contrary, showed no trace of Japanese influence, all coming perfectly and truly incurved. The whites varied to yellow, and yellows to white.

It has been suggested that better results might be had by emasculating the fertile florets of the disk, pollenizing only the ligulate florets. In my experience, seeds from the ligulate florets are not produced in the proportion of more than one seed to one flower, or, botanically, one head of flowers. A further, and more reasonable, suggestion is to take the fertile florets found scattered through the ligulate ones, even in the most double flower, as being less liable to insect agency than an open disk.

The deductions are, that while artificial crossing may, and often does, give the result looked for, we have not yet established any laws which we can trust with any degree of certainty.

Wellesley, Mass.

T. D. H.

New Cypripediums.

To the Editor of GARDEN AND FOREST:

Sir,—Cypripedium \times Ephialtes is the name proposed for a cross between *C. insigne* Chantinii and *C. aureum*. It is compact in habit; the foliage is sparsely mottled with deep green on a pale ground, silvery underneath; the single flower is produced on a brown pubescent scape; the dorsal sepal is orbicular, pubescent on the back, front smooth, very pale green, bordered with white and carmine, with the radiate veins bright green, the principal ones spotted with brown; inferior sepal veined with pale green, petals pointed, margined with black hairs, rich brown, veined and shaded with green, with an occasional dark brown spot on the surface and margin, lip acute, brown on front, pale green beneath, with darker veins, infolded lobes dull waxy yellow, speckled with brown, staminode green and brown.

Cypripedium \times luridum, var. grandiflorum, is the largest of the Harrisianum section, and one of Pitcher & Manda's hybrids between that species and *C. aureum*. The foliage is bold and striking, scape pubescent, flower waxy, dorsal sepal twisted, veined with dark green, and shaded with brown on a white ground; petals minutely pubescent on margins, rich brown with green nerves, and a median line of dull purple; lip dull green-yellow, faced and veined with brown.

Cypripedium \times Cybele. This beautiful hybrid is the result of a cross between *C. Drurii* and *C. Lawrenceanum*. The foliage is glossy, compact, six inches long by two wide, light pea-green with deep green neuration; scape and seed-pod brown, very pubescent; flower much the shape of *Drurii*; dorsal sepal flat, slightly incurved, villous on the back and margin, white, shaded and reticulate veined with pale green and vinous brown, with a deep brown midvein; inferior sepal white, with striate green veins; petals somewhat incurved, with apices reflexed, pilose on the margins, brown, shaded with green, with a median vein of rich vinous purple, spotted near the base with brown; lip symmetrical, rich waxy brown, paler beneath, pubescent and speckled with purple inside; staminode broadly obcordate, vinous purple, with a pale green spot in centre. This plant is one of the most conspicuous of the genus. It was raised by Pitcher & Manda.

All three of the above plants are now in bloom in the collection of Mr. Graves, of Orange, New Jersey.

Orange, N. J.

Robert M. Grey.

Snow Scenes.

To the Editor of GARDEN AND FOREST:

Sir,—This morning everything was covered with a mantle of soft snow, like that more often seen in late winter or early spring. The impressions, always so pleasing, which such a scene gives, were in this case heightened by the fact that some trees and shrubs have not yet lost all their foliage, and the effects produced by the different manner in which the snow was held were especially pleasing. An Apple-tree, for example, still bearing a few leaves, had the outlines of its crowded angular twigs brought out with particular distinct-

ness. Near by is a bank of natural forest-growth, largely composed of tall evergreens, among which an occasional deciduous tree reached out its bare arms, now conspicuous with their covering of white. On the street a group of Birches still held most of their foliage, and the faded color of the leaves, inseparably mingled with the minute patches of white, produced a curious, if not wholly artistic, effect. The Hemlocks and Pines stood out in strong contrast, one with its broad and heavy masses of white, the other with its more broken and varied outline, or in older and more thinly leaved specimens, with the needle-like leaflets still upright, and holding their beautiful load like a broken mass of foam.

These varying effects all emphasize the value of mixed groups in planting, and also the advisability of considering the character of different trees and shrubs in respect to this phase of their winter aspects. These lessons come but seldom, yet to most of us they pass unheeded. Even this is written from memory, as the scene is recalled. No doubt I could have found many specially beautiful effects to note if my attention had been fully aroused this morning, but now they are gone and I can only regret that, having eyes, I saw not until it was too late.

Cornell University.

Fred W. Card.

Exhibitions.

The Cincinnati Chrysanthemum Show.

A MOST delightful exhibition opened in this city on November 8th, and continued throughout the week. Music Hall, one of the grandest auditoriums in the west, was tastefully decorated for the display of cut flowers, which were arranged on large tables nicely draped in yellow, the predominant color, and which made a pleasant setting for the tall crystal vases, which were large and heavy enough to display to their very best advantage the truly regal specimen blooms sent in by the numerous exhibitors, who had been attracted by an unusually liberal premium list.

One of the most attractive entries in the show was that calling for three blooms each of fifty distinct varieties. Nine tables of 150 blooms each competed in this class, constituting a whole exhibition in itself, and so uniformly good were these entries that the judges, Mr. John Thorpe and Mr. E. A. Wood, had considerable difficulty in forming their decision. Mrs. F. T. McFadden was awarded first premium, \$150; E. G. Hill & Co. came a close second, and Frederick Dorner a very close third. The number of varieties of recent origin was most noticeable, and we specially noted the following recent novelties, all in fine form, as weak stems and poor foliage were debarred from premiums: Edward Hatch, Harry Balsley, Mrs. Governor Fifer, George W. Childs, Colonel Smith, J. H. Taylor, Elmer D. Smith, Mermaid, Roslyn, Harry May, Sugar Loaf, Eda Prass, C. B. Whitnall, Golden Gate, Dr. Callendreau, Madame Forgeot, Marguerite Jeffords, Hicks Arnold, Mrs. L. C. Madeira, Potter Palmer, Viviani Morel, Mrs. Drexel, Flora Hill, Jos. H. White, besides many others from the recent sets. Harry Balsley attracted much attention, its color being similar to that of V. H. Hallock, and Marguerite Jeffords, as shown by Dorner, was one of the finest flowers in the hall, regular and very compact, and of fine size and color.

Of almost equal interest with the above was the class calling for best fifteen varieties, three flowers of each. This was won by George R. Gause & Co., Richmond, Indiana, and was generally thought to contain the most uniformly excellent flowers in the show. The fifteen varieties were: V. H. Hallock, Marguerite Jeffords, Mrs. A. J. Drexel, Mrs. L. C. Madeira, S. W. Allerton, Frank Thomson, Colonel Smith, L. Canning, C. H. McCormick, Edw. Hatch, Mademoiselle C. Krieger, Golden Gate, M. Wanamaker, Harry Widener.

The prize for twelve best pink blooms was won by Viviani Morel; twelve best white, by Ivory; twelve best yellow, by H. E. Widener; twelve best of any color, by E. G. Hill; and a vase of twelve Mermaids, shown by George Gause, was so fine as to call for a special award of merit.

As usual, very great interest centred in the seedlings; the award for the best one never exhibited previous to 1892 was won by Nathan Smith & Son with Niveus, a very fine white variety of immense size, a perfect ball of straight erect petals, the foliage showing it to be a fine grower. For second best seedling not previously exhibited, the award was made to Henry Rieman, of Indianapolis, for Irma, a small, perfectly incurving Chinese, of violet-pink color. This won enthusiastic commendation from both judges, but, as usual, the Chinese regularity failed to please the public at large, as do the more imposing Japanese forms.

The Storer prize for best white seedling was won by Frederick Walz, with *The Queen*; this also won the premium for best white at Madison Square last week, and is a most beautiful novelty. The Schindlapp prize was awarded to E. G. Hill & Co. for best pink, named *A. T. Ewing*, a broad ribbon petaled variety of great substance, the color arranged in bands on creamy white. The Hinkle prize was won by the same firm for best crimson variety, Mrs. J. W. Crouch, a large incurving sort, with broad petals of purplish crimson.

E. G. Hill & Co. also won the Florists' prize, with Robert McInnes, an immense, perfectly double Wheeler of the brightest red and gold. These two also won first in their respective classes last week at New York.

The Longworth prize, best yellow, was won by Harry Sunderbruch, raised by Frederick Walz. This variety appeared elsewhere also in beautiful bush form, showing it a good sort for pots as well as specimen blooms.

National Society certificates were also awarded to Peter Henderson & Co. for their Golden Wedding, winner of the GARDEN AND FOREST cup, the Cutting cup and another capital prize at Madison Square. To Frederick Dorner, for Mrs. C. H. Duhme, a feathery white of the greatest beauty; for Autumn Queen, a fine globular yellow; for Sarah Hill, a golden yellow of great substance. E. G. Hill & Co. received certificates for Mayme Ryar, a Japanese Anemone; Robert McInnes, the double Wheeler, which recently received first prize at Madison Square; for Judge Hoitt, an enormous pink Anemone, and Maud Dean, a rosy pink, very large and of flat incurving form. Mr. Walz received certificates for Theodore Bock, a lovely rounded pink, Vesuvius, a beautiful amber-yellow with touches of reddish brown, and also for the prize-winner among whites—his beautiful White Queen. Several other seedlings of great merit were passed by this year which certainly will be heard from again. Every entry made in this class was of great merit, and the table was most remarkable as containing not one freak or curiosity—form, fullness, size, color, stem, foliage being finely exemplified in each case.

The pot-plants were arranged with effective taste in Horticultural Hall, which is reached from Music Hall by a covered corridor. Winding walks were bordered by bands of Crowfoot and Laurel tacked to the floor, and enclosed the various exhibits. The general effect was that of a garden in full bloom, the centre-piece, a grand pyramid of Palms, very restful to the eyes. A most instructive class was the eighteen market-plants, which were a good object-lesson, and a necessary one, to many a florist present; one group averaged about two feet in height, and carried from sixty to seventy perfect blooms of medium size; most notably beautiful were Ivory, L. Canning, M. Boyer, W. H. Lincoln, Puritan, Ada Spaulding, Princess Beatrice and E. G. Hill. In another entry for this premium were George W. Childs, Mrs. Craig, Hicks Arnold and Minnie Wanamaker, all in extra good form.

For the best collection of twelve plants in twelve varieties the winning exhibit contained Miss M. Wheeler, E. G. Hill, T. C. Price, G. F. Moseman, Mrs. Humphrey, Mrs. Fottler, Domination, Kioto, Grandiflorum, Ada Spaulding, Delie and Rosebank. There seems to be an increasing interest in well-grown pot-plants, and many florists were busy with note-book and pencil among the finest specimens. For five finest whites in bush form the winning plants were Domination, R. Bottomly, M. Wanamaker, Mrs. Humphrey and L. Canning. The finest specimen white in the show was Minnie Wanamaker, and this noble variety again won admiration in the best fifty plants, one variety, grown to a single flower, but was closely followed with fifty specimens of Ivory grown in the same style.

There were five entries in the class calling for 100 plants, not more than four of a kind, grown to a single flower in seven-inch pots. Here, again, the competition was very close. The sorts which at once caught the eye were Princess of Chrysanthemums, Harry Widener, Kioto, Baronald, V. Morel, F. Thomson, Eda Prass, R. Maitre, Mrs. Langtry, International, L. B. Bird, Mrs. Simpson and C. H. McCormick.

Four magnificent groups of Cannas, composed of fifty plants or clumps each, made a blaze of color against the dark gray wall. The McFadden group was almost exclusively Madame Crozy; E. G. Hill's group contained some ten of the latest Crozy novelties; very conspicuous were J. D. Cabos, A. Bouvier, H. A. Dreer, Miss Sarah Hill, F. Thomayer, Capitaine Suzzoni, Duchess Mortemarte and Nardy Pere. These won the very liberal premium of \$150, the McFadden group taking second. The other two groups had been injured in transit; but a point to note on Canna exhibits is that the blooms improve each day of the show, as the buds unfold and replace the fragile beauties, which are always injured more or less, despite the most careful packing.

Roses and Carnations, which reign eleven months in the year, were shown in grand style on Wednesday. American Beauty was in especially fine form, grand bunches on long stems forming a centre for each exhibit. American Belle, the new sport, was also shown in fine condition, and was most critically examined by every florist present. Nanz & Neuner showed white La France in great perfection. Madame Caroline Testout arrived too late to enter the lists, but was constantly the centre of an admiring crowd.

The grand surprise of the show, however, came when Mr. Peter Herbe, of Mount Healthy, set up his Carnations. He showed several seedlings of immense size, one of the Anna Webb type fully three inches across; a second of reddish pink fully as large and of magnificent build, which was awarded first premium. These two seedlings are most remarkable, notwithstanding the fact that one shows a rather weak calyx, and the other a slender stem. They mark a distinct departure in this exquisite family. Mr. Dorner's seedlings were out in lovely array, with bright clear colors and good stiff stems, and they made a beautiful display of some ten fine novelties. Mr. Witterstaetter showed Daybreak in absolute perfection, its only rival being Edna Craig, which stood up bright and crisp as crystal.

We cannot close without a passing word for the display of Ferns and Palms. Finer examples of the Adiantums are seldom seen than those in the Huntsman collection, some of them nearly three feet across. Extraordinary specimens of *Pteris argyrea* were seen, and Critchell made a grand display of neat medium-sized plants in some forty varieties, which proved a most interesting study for the lover of this beautiful family. There were three grand displays of Palms beside the centre-piece. *Areca lutescens*, *A. Verschaffelti*, *Chamærops filamentosa* and a *Phoenix rupicola* were magnificent.

The two tables of Cyclamens by Mrs. McFadden and Julius Peterson were surrounded constantly by admiring crowds. Every plant was in great perfection both as to foliage and bloom, and the effect was only second in point of beauty to the singularly rich and rare Orchid display made by John Rose, of Rosebank.

Recent Publications.

Field-Farings. By Martha McCulloch Williams. Harper & Brothers.

This neatly bound and printed book adds another to the numerous "nature studies" which have become such a prevalent modern fashion. In thirty-two separate sketches we find sympathetic descriptions of many varied phases of earth and sky. Beginning with "Snowfall," and ending with "Come Christmas Day," this out-of-door calendar of the year records pleasant and profitable rambles by tinkling brooks and through green meadows, and quiet walks in brown fields and deep woodlands. There is no attempt to discuss scientific questions or to draw profound moral lessons, but a "Vagrant Chronicle of Earth and Sky," the not altogether unaffected sub-title of the book, reveals a habit of close observation and of delightful familiarity and friendship with nature, animate and inanimate. The keen enjoyment of country life under the open sky is shared by the reader, for the descriptions have an evident basis of real experience which is at once satisfying to the lover of nature, and impressive and inviting to such as are content with a merely passive enjoyment through wanderings by book.

The chapter on "New Ground" shows an appreciative understanding of the forests, and suggests an attractive field of study for women. The gaining of new ground for the husbandman by the woodsman is vividly described, and a practical knowledge of the quality and uses of timber of various trees is shown. Foxes, minks, weasels, wood-ducks, wild turkeys and other inhabitants of water and woodland are described in their favorite haunts and at various times and seasons. To the restful, quiet walks, in which the reader takes part, is added the excitement of a fox chase in the chapter "In at the Death," and the hunter, teamster, farmer, woodsman and fisherman all play their part in these picturesque sketches. The latitude of West Virginia is suggested in descriptions of a land of snow in winter, of planting-time in March and April, and of Walnut, Hickory, Tulip, Sycamore and Magnolia trees, and orioles, humming-birds, 'possums and 'coons.

The chief charm of the book is not, however, in its account of the song of birds, the patter of summer rain or the silent caress of enfolding snow, nor in the happy sketching of the habits of wild plants and animals. Its deeper merit consists in an insight into the poetical and practical significance of

many commonplace things which seldom receive attention, or, at most, only passing notice as a general part of the landscape.

These glimpses at nature are not a little marred by an affectation of archaic and unusual words and phrases. The very first sentence opens unpromisingly with "An you love nature," and this is followed by "awreath," "arustle," "ahuddle," "aperch," and many more disagreeable words. This blemish of artificiality is so evident that it inspires the reader at first with distrust of the genuineness of the descriptions and comments, and it requires some patient effort to find out the worth of the book. *Field-Farings* is best read in snatches, and a chapter indoors in winter has something of the pleasant refreshment of a summer ramble across fields and in shady woodlands.

Notes.

It is a matter of surprise that the Cape Heaths are not grown more frequently than they are. Twenty pots of *Erica Wilmoreana*, all evenly grown and well furnished with delicate pink flowers, were shown at Madison Square Garden by Louis Dupuy, of Whitestone, Long Island, and were universally admired.

The National Chrysanthemum Society, of London, have issued a supplement to the customary edition of their official catalogue. It contains a carefully revised list with short descriptions of all varieties introduced since the publication of the list of two years ago. This is the standard publication for Chrysanthemum names, and of interest to all growers of these flowers.

The Chrysanthemum which was exhibited at the Philadelphia exhibition a fortnight ago, and for which its originator, Mr. David Cliffe, received first prize as the best pink flower, has since been named Magnet. The color is described as a cameo-pink, with the inner part of the petals rather deeper in shade. It is an incurved flower, very double, full, and shows no centre. It keeps unusually well, is a flower of the largest size, and has a strong habit and good foliage.

A horticultural journal published in Ghent says that the indoor cultivation of the Castor-oil plant has been recommended as a protection against the summer plague of flies. "We are told," says the writer, "that if a single small plant is placed in a room, all the flies the room contains will soon be found glued to its leaves, or, assassinated by its juices, strewing the floor in its vicinity. We do not vouch for the truth of this statement, but so simple and cheap an experiment is certainly worth trying."

Changes have recently been made in the plans for the monument to Alphand, the famous landscape-architect, which, immediately after his death, it was decided to erect in Paris. Instead of Monsieur Formigé, the architect first selected to design the monument, it will be designed by Dalou, one of the two or three greatest sculptors in France. It will stand in the square called St. Jacques-la-Boucherie, which surrounds the famous Gothic tower of St. Jacques, which was laid out by Alphand himself.

A correspondent of *The Tribune*, speaking of certain peculiarities of California, states that tropical fruit may be grown in the foot-hill belt along the base of the Sierra Nevada Mountains as far north as the parallel of Springfield, Illinois. Some of the finest Oranges in the state are grown at Oroville, in Butte County, and the Orange-groves are irrigated by old mining ditches. Near Auburn, in Placer County, a rancher has fine Banana-trees which produce fruit, and they have no other shelter than a stout hedge.

In addition to the plants named in another column of this issue as suitable for baskets, *Cissus discolor* should not be forgotten; its richly variegated foliage is specially attractive when pendent from a basket. Another point in favor of this plant is that it is so easily grown and propagated. *Panicum variegatum*, old and common as it is, is a useful plant, and as any small shoot of this grass may be planted with the full assurance that it will root, there is no difficulty in keeping up a stock of it or making up a flourishing and attractive basket at short notice.

A correspondent of the *Monthly Bulletin*, of the Horticultural Society of Mons, writing recently of the American Red Oak and of the comparisons so often drawn between it and the indigenous Oak of Europe, says that he recently examined trees of both these species growing in a private park in the

neighborhood of Mons. The Red Oaks, at one metre from the ground, showed an average circumference of one metre five centimetres, while the common European Oaks (*Quercus robur*, var. *sessiliflora*), which stood near by and had been planted in the same year, gave an average of only seventy centimetres.

The many parks of Berlin, according to a correspondent of the *Evening Post*, "are almost entirely cared for by women—old women—who wear large black straw hats, sloping down from the crown in all directions, and blue jean aprons. The grass is never raked, but swept with large brooms made of birch-twigs, and the old women go all over it and the gravel walks, keeping both as neat and trim as possible. In the Thiergarten all the fallen leaves and twigs and fagots are promptly gathered, and one never sees even the remotest corner any other way than exquisitely well kept."

An illustrated monthly paper, called *The Whole Family*, which has just been started in Boston, will for some time to come devote an article in each issue to "The Parks and Pleasure-grounds of America." In the first number Boston Common was described, and its history—of course, the most interesting history of any of our public pleasure-grounds—was recounted; in the current number we are told about Druid Park, in Baltimore, which, perhaps, is more natural-looking than any other of equal extent that we possess; and both the articles are accompanied by good reproductions of well-chosen photographs.

Many species of Mesembryanthemums, natives of Africa, the Canary Islands, Australia and other southern regions, are well known in American gardens. But in the south of Europe they are much more extensively employed, and a number of them are almost naturalized, especially in the south-western parts of France. It is interesting to read in a recent issue of *Le Jardin* that at least one species, *M. crystallinum*, our familiar Ice-plant, supposed to be a native of the Cape of Good Hope, grows there sub-spontaneously, especially in chalky regions, and has been recommended as an article of food. It is to be prepared, we are told, in the same manner as spinach.

According to the *Southern Lumberman* it is an admitted fact that Poplar-timber is practically exhausted. Of course, there are tracts where a great many of these trees are still found, but each season will bring fewer logs and of lower quality, so that the lumbermen are looking out for the best substitute. Cotton-wood seems to be the only resource, and the eyes of the lumbermen are now on the delta lands of the Mississippi and its lower tributaries, where there are vast forests of this timber, soft, straight-grained, easily worked, that will answer as a substitute for Tulip Poplar, both for inside and outside use. The timber holds paint well, and when it is kept painted it is quite durable.

Some years ago artificially colored flowers, as ugly as they were ingenious, appeared in our shop-windows. The vogue they enjoyed was very short, for in a few weeks not a specimen could be found. Last year similar flowers became quite fashionable in London; and now, we regret to say, they have reappeared in New York. Even the great bunches of Carnations, colored a sickly bluish green, which the window of a florist on Broadway displays, are not quite so offensive as the Chrysanthemums, similar in color, which the street-venders on Twenty-third Street offer. The former look like impossibly ugly real Carnations, but the latter look like paper-flowers manufactured by some artisan with uncommonly bad taste.

The most valuable product of the Eucalyptus-trees which are planted in California are the essential oil and certain medicinal preparations from the leaves. The distilled extract from Eucalyptus, which resembles in its method of production the well-known distilled extract of Witch Hazel, has come into prominence within a few years. It is a concentrated extract from freshly gathered leaves of trees that are at least seven years old, and the older the better. It is used for most of the ailments where the oil has been used, and has the advantage of being cheaper. It has been recommended for headaches, nervous affections, and as an antiseptic it has given good results when applied to fresh wounds, and for inflammation of the mucous membranes and insomnia; for cold in the head and sore throat it is of service, while as a disinfectant it is useful from the fact that, like the oil, it substitutes a pleasant odor for noxious ones. The oil has an established place in the materia medica, and there is evidently a field of usefulness for the distilled antiseptic.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLES:—Specialized Horticulture.....	565
The Movement to Preserve the Forests of the White Mountains.....	565
A Disease in the Vineyards of California.....	566
On Broad Top.—I. (With illustration.).....	<i>Mira Lloyd Dock.</i> 566
Late Autumn in The Pines.....	<i>Mrs. Mary Treat.</i> 567
Gardening in the Confederacy.....	<i>O. W. Blacknall.</i> 568
NEW OR LITTLE-KNOWN PLANTS:— <i>Celastrus scandens.</i> (With figure.).....	568
FOREIGN CORRESPONDENCE:—The London Chrysanthemum Exhibition, <i>W. Watson.</i>	568
CULTURAL DEPARTMENT:—Propagating New Strawberries.....	<i>O. W. Blacknall.</i> 570
A few Notable Shrubs in late November.....	<i>J. G. Jack.</i> 571
Orchid Notes.....	<i>M. Barker.</i> 572
Basket-plants for Window Culture.....	<i>W. H. Taplin.</i> 572
Chrysanthemums Naturally Grown.....	<i>J. N. Gerard.</i> 573
<i>Sonerila Hendersoni.</i>	<i>B.</i> 573
CORRESPONDENCE:—About Irises.....	<i>C. B. W.</i> 573
<i>Dolichos Japonicus.</i>	<i>A. H. Olmsted.</i> 574
Wood Roads on Cape Cod.....	<i>Mrs. Schuyler Van Rensselaer.</i> 574
The Niagara Reservation.....	<i>John Chamberlin.</i> 575
PERIODICAL LITERATURE.....	575
NOTES.....	575
ILLUSTRATIONS:— <i>Celastrus scandens</i> , Fig. 97.....	569
Road through a Chestnut Wood on Broad Top, Fig. 98.....	571

Specialized Horticulture.

THE request for certain information about Irises, which a correspondent makes in another column, suggests a subject to which we have before alluded, and that is, the instruction and recreation which can be derived from the careful cultivation of a single class of plants. Irises constitute a varied and extensive genus of perennial plants, and they rank among the most beautiful of garden-plants. They range in size from that of the towering *Iris (Moræa) Robinsoniana*, which has been figured in our columns, to the delicate little species like our own Crested Iris, which nestle close to the ground. Some of them are of the easiest cultivation, like the hybrids known as German Irises, and others like some of the *Oncocyclus* group are perverse, or, at least, wayward in cultivation, and require sympathetic care and the highest skill. Irises have always been favorites of those who devote themselves to the cultivation of herbaceous perennials, and yet there is enough to learn about the genus to fill the leisure hours of any one for years to come. Occasionally there is an enthusiast like Professor Michael Foster, of Cambridge, England, who keeps on the alert for every novelty of the family, and who tests each new one in his garden, but the flowers, in spite of their beauty, have never had any vogue like *Chrysanthemums* or *Dahlias*, and no Iris society has yet been formed, to our knowledge. So far as we know, there are not many large collections in this country, although one of our correspondents, Mr. J. N. Gerard, has cultivated about one hundred and twenty-five species and many more garden varieties.

Few occupations are more fascinating than specialized gardening of this sort. It is easy enough to get a general idea of any class of plants, but the farther we descend to particulars the more there is to study and to admire. If we care for garden decoration simply, we select for our purpose such plants as can be used with the most marked decorative effect; but as soon as we begin to have a special

interest in one class of plants we are drawn to them as to personal friends by an entirely different kind of attraction. We are eager to know all about their relatives and the habits of the family, and we are ready to study and explore every field from which any knowledge of our favorites can be gained. One can soon learn to grow, for example, all the species and varieties of *Iris* which make a show in the garden, but if he aims to be an expert in the cultivation of Irises, or to possess himself of authoritative knowledge concerning them, if to his admiration of their beauty and his affection for the special genus he adds the enthusiasm of a collector, he will have not only a diversion that will occupy all his leisure moments, but one that will also absorb as large a fraction of his surplus revenue as he chooses to appropriate for the purpose.

The enthusiast is cheered and sustained in all his labors and studies by the hope of securing a plant he has never seen, or of inducing one to flower with which he has often failed; and yet the results of his thought and care extend far beyond his personal gratification. The men who make a special study of a single class of flowers are the ones who really add the most to the general knowledge of plants. There is enough in many single genera of plants to occupy the leisure of a lifetime, and the plants only yield up their secrets to those who give them patient and affectionate study year after year. We have mentioned Irises, but, of course, there are many other genera which have their ardent devotees—enthusiasts who have their reward in the daily delight of increasing knowledge, but who also enlarge and enrich the art of horticulture by their experience. Daffodils, in their unending variety, have long been favorites of specialists in Europe, although large collections of them are rare in this country. Lilies appeal to a still larger class. The Saxifrage, hardly known in gardens conducted on conventional lines, has already become a pet flower of the specialist, and a list of the different species which can be furnished to buyers will occupy several pages in a catalogue like that of Monsieur Correvon, of Geneva. The various articles which we have published from the pen of Mr. W. E. Endicott show how wide is the range of knowledge and experience he has gained while recreating himself with the cultivation of the beautiful Cape bulbs, and his instructive writings on the subject are admirable examples of the extent to which the horticultural world is at last indebted to these special students.

When we begin with the greenhouse there is no end to the attractive families which invite special investigation. But if we undertake any branch of specialized horticulture, one of the first things we learn is not to attempt too much. We do not need to abandon all interest in general horticulture, for very likely a special devotion to one class of plants will give us an increased pleasure in all others. But the field of our systematic operations must be limited, and we shall be surprised to find that however we restrict its boundaries we shall still have too much for the careful study and experiment we feel inclined to give. This is the rule, and in this way has horticulture ever received its strongest impulse. In this direction too, lie some of the purest delights of the garden; in fact, there is no other way in which so much satisfaction can be derived from the cultivation of plants.

It is gratifying to observe that the movement to preserve the forests of the White Mountains, of which we gave an account some weeks ago, is meeting with very general endorsement by the papers of New England and the middle states, and that a fund has been started by the Boston *Herald* to aid this campaign of education. There is no need of any additional argument to show that the loss of these New Hampshire forests would be in the nature of a national calamity, or to prove that such a danger is constantly threatening so long as these forests remain in private hands and under our present laws. It is not an easy problem to decide just how this danger may be averted with the least friction to private interests and established customs, but

certainly nothing but good can come of such discussions as those now carried on by Mr. Harrison in every part of the state of New Hampshire where an audience can be gathered. Of one thing we may be assured, and that is that no effective action will be taken by the men who are chosen by the people of New Hampshire to make their laws until the people themselves are thoroughly educated to comprehend and appreciate the paramount importance of these forests to their general prosperity.

As is well known, the vineyards of California, especially those in the southern part of the state, have suffered severely from a disease first recognized by the appearance of discolored spots on the leaves. In some localities it is known as the Black Measles, and the damage to the crop has been very considerable. A number of persons have attempted to discover the cause of the disease, but hitherto no one has succeeded in detecting the fungus, if it be a fungus, which causes the trouble. Recently Messrs. Viala and Sauvageau have published the results of their investigations at the Ecole de Viticulture, in Montpellier, France. They recognize two diseases very similar in the effects they produce, one found in Europe and the southern United States, the other only in California. The former was first noticed in France in 1882, and is called *La Brunissure*; the latter, called by Viala and Sauvageau *Maladie de Californie*, is decidedly the more destructive of the two diseases. Both diseases are caused by species of *Plasmodiophora*, a genus of *Myxomycetes*, to which belongs the fungus which produces the so-called club-foot of cabbages. The fungi of this group consist merely of masses of protoplasm without the definite mycelial filaments of other fungi. The fungus of *La Brunissure* is called by Viala and Sauvageau *Plasmodiophora vitis*, and that of the *Maladie de Californie*, *P. Californica*. In neither species were they able to detect spores. The plasmodium of both species is found in the green cells of the leaves, especially in the large palisade cells, which are found just beneath the epidermis of the upper side of the leaves, and it varies greatly in shape and amount in different cells.

On Broad Top.—I.

WHERE is Broad Top? What is it like; and what do you do there? For many years, as the time approached for our autumnal trip to this out-of-the-way part of Pennsylvania, we have been asked these questions and have found no trouble in answering the first, but the last two are more difficult to explain, for the place is so unlike all conventional mountain resorts. It is not, indeed, a resort in any sense, but a mountain wilderness, happy in having few special features, no points of interest, and little of what the reporters call "fine scenery."

Charles Dudley Warner somewhere speaks of tourists who search for "scenery that ranges from the two-dollar to the five-dollar a day kind," and this is not the place for them, nor can they understand the beauty of these shaded moss-grown roads on the abandoned farms (see illustration, page 571); of the woods and sunny meadows; above all, of the sense of remoteness which forms much of the indefinable charm of the place. It has had devotees in our family for years, since two belated hunters found refuge overnight in the little log-house that not only shelters us when we come to the mountain, but is still the home of the same family who lived in it then. That family, and others scattered at intervals over the mountains, are the remnants of a life that is passing away, a primitive Pennsylvania that will soon vanish as the spirit of "Progress" spreads over these wilds, and railroads, mines and hideous coke ovens invade the "hollows," and the "runs," that have heretofore been so beautiful.

The Broad Top country is a mountainous region with an average altitude of 1,800 feet, lying in Bedford, Huntingdon and Fulton counties, and is the eastern limit of the bituminous coal measures. It is reached on its northern and western borders by the East Broad Top and Huntingdon Railroads, the former connecting with the Pennsylvania Railroad at Mt. Union, the latter with the same road at Huntingdon, and between these two places are some of the boldest and most beautiful mountains to be found along the Juniata.

The southern and eastern borders of the country can only be reached by mail-wagon or private conveyance, as Fulton County does not possess a mile of railroad, though the South Pennsylvania road, if ever built, will cross it and open up to the world its beautiful valleys and mountains. Although the general outlines of the mountains follow the parallel system so noticeable in Pennsylvania, here in the coal country they are picturesquely broken, the valleys in many instances are really deep ravines, taking their names from the streams that run their short but active life through them. These streams were once the haunt of the trout, and their banks the home of the *Rhododendron*, but some of the most wild and beautiful ones are now blackened in their lower reaches by the wash from mines and dumps, and the ravines are made hideous by squalid villages.

The mountains are tremendously steep, but there are few rocky precipices, as in most instances the outcropping rock has been so shattered by the action of frost and time that landslides have been formed, smaller, but like those so noticeable along the Narrows of the Juniata. The mountains have been, and still are in many places, magnificently wooded, and the forest-growth is most varied and interesting; many of the White Oaks are superb, but with the increase of building one fears their days are numbered. The work of the saw-mills is, of course, a necessity, but the waste is so terrible that we carefully avoid seeing one in operation a second time, for it is painful to note the great branches left in the woods and the slabs that are run directly from the saw into the fire. The waste of a saw-mill, however, is a trifle compared with the destruction of the bark-peelers, who, after gathering their harvest, leave the spectral bodies of what were once trees to a slow decay, unbeautiful by the kindly moss which almost at once begins to cover the fallen timber not denuded of its bark.

On the map at the junction of the three counties above mentioned is an irregular expanse marked "Broad Top Mountain," between eight and ten miles long, and varying from two to four miles in width. The greatest altitude, about 1,800 feet, is at the southern extremity. From this head, which is a wilderness miles in extent, enormous arms and "saw-teeth" project boldly into, and separate, the valleys below. The township roads crossing the lower end of the mountain are built along and down these arms, and, except for occasional reaches of Oak-barrens on the higher levels, one may drive for miles in any direction through almost continuous shade. The roads are of two kinds—those that are "wagoned a heap" and those that "hain't wagoned so much"—and we find the pleasantest drives are those where the wagon goes ahead and we follow on foot. The mountain is literally a broad, though by no means a flat, top, and has a little system of its own of inner ridges, plateaus and an upland valley formed by Trough Creek, which rises near its head, and almost equally dividing this inner table-land, flows north until, after a long and devious journey, it empties into the Juniata.

The country was settled about the beginning of the Revolutionary War by English and Scotch-Irish emigrants from Maryland, who took out warrants for land that, in most instances, was held for several generations by descendants of the original settlers until the absorption of the small holdings by the large coal and iron companies.

A good spring was the first requisite for a site, and that once found, land was cleared, log-houses built, orchards planted, until, in a few years, farms, some of them quite extensive, were scattered over the mountains, though at a safe distance from their nearest neighbors, as game was a necessity. About the beginning of this century coal was discovered, and, with the advent of the railroads, that Golden Age, when "a man could open his door at sun-up and shoot a deer in his garden," when turkeys and pheasants ruined the buckwheat-crop, and when no man was considered fit to hold a rifle who shot game anywhere save through the head, disappeared forever.

About 1855 there was a mining and railroad boom. Most of the land passed into the possession of corporations, and the movement has continued until now a few large companies control the country. On Broad Top Mountain, with the exception of a few farms on the northern border, held on leases from the companies owning them, all the farms were, of course, abandoned.

The men who sold them felt themselves the possessors of immense wealth, and, in many cases, simply departed with their goods and chattels, leaving their houses and barns to the elements. Others removed their logs and timber and built elsewhere, but one and all left behind them what was almost imperishable—the restful beauty of the place. The little mountain farm that we have known so long lies within the encircling rim of the mountain, upon a partially cleared promon-

tory of land, that juts down from the upper plateau, between forests that clothe its sides and lower extremity, and conceal two little tributaries of Trough Creek, which unite near its base. With one single exception, the nearest human habitations are more than a mile distant, out of sight and sound, on the outer side of the western ridge.

Wray's Hill, which forms the eastern ridge, does not show a sign of life, and, except toward the north-west, there is not a house within a radius of five miles, though within that same radius are nine abandoned farms and several small clearings. Some of the farms are included in the leases held by two or three families of still occupied farms, and they keep in repair fences about the old orchards, gather the fruit, pasture cattle in the old meadows, and when mountain fires occur are bound to protect the company's property by "fighting fire," whether upon their own or the abandoned farms.

The middle of September finds us, after a railway journey up the always beautiful Juniata, landed in a most unpromising little station in the heart of the coal country, but even the dust and grime of the place cannot conceal the beauty of the hills and mountains surrounding it. We soon find the old wagon, gun-case and camera are stowed away, and we start off for our two hours' drive, most of it a steady climb.

For three miles up the narrow valley the road has lost its original beauty, as the flood of 1889 changed the course of the stream, and covered the valley with the waste from the dumps. Most of the foliage is still as green as in midsummer, but as our road ascends higher and higher, giving us views, now down a deep ravine, then off to the hills, we recognize the familiar landmarks, and finally, after a mile of road that would have driven Macadam insane, we turn the shoulder of our own mountain, and the panorama of what is always our first and last great view is spread out before us. In the right foreground is Round Knob, showing faint tints of gold and flame along a line of Hickories and Maples at its base, and in the distance rises tier upon tier of the Alleghanies until the remotest line is merged into clouds.

Plunging into the woods we continue our ascent on a fairly good township road until we leave it for the series of boulders and rocks that form the road to our destination, for few of the mountain farms are found near the public road. A short climb and we are out of the woods, on the level, and surrounded by the most brilliant, surprising mass of color. The Thorn Locusts and scrub Oaks, which here form a short stretch of barrens, seem to support beds of color, young Sassafras-trees, which are in coloring the counterpart of Parrot Tulips, and are absolutely blazing in the brilliant sunlight. Then into the woods and down a short distance, and as we emerge into the sunlight the little farm is spread before us; the orchard with old cider-press in its corner, Wray's Hill opposite us, the little log-house just as it looked last year, the same Dahlias apparently by the gate. The wagon stops, the same voices rise to greet us, we step down and realize that we are once more on Old Broad Top.

Harrisburg, Pa.

Mira Lloyd Dock.

Late Autumn in The Pines.

I HAVE just returned from a ramble in the Pines, and, notwithstanding the excessive drought during late summer and autumn, I found a greater number of plants in flower than usual at this time of year. The Soapwort Gentian was never more beautiful than now, and good specimens of Gentiana angustifolia were also in the damp barrens, and little *Bartonia tenella* was still in bloom. Some belated flowers of the Meadow Beauty (*Rhexia Virginica*) were looking as if they had forgotten that it was late in November. *Rudbeckia laciniata* was here with long, drooping yellow rays, which looked charming with the blue Gentians. Blue and white Asters were not rare. *A. nemoralis* was particularly good. Two or three species of Golden-rod were also seen in damp places vieing with the Asters in perfection of leaf and flower. The most handsome of these late-flowering Golden-rods are *Solidago sempervirens* and *S. elliptica*; both have smooth shining foliage as beautiful as the flowers.

Along the margin of a pond I found *Coreopsis rosea* still in bloom, and Ladies' Tresses (*Spiranthes cernua*) were hidden among the grasses, bright and sweet as they were a month before. The Bur-Marigold (*Bidens chrysanthemoides*) was abundant in wet places, and it is one of our handsomest late flowers. It has broad deep yellow rays, an inch or more in length, which, together with its connate leaves and long-continued bloom, make it a very desirable plant. The Mist flower (*Conoclinium coelestinum*) was also here with pretty clusters of blue flowers. Coils of matted flowers of the Dodder were still blooming, looking almost like ropes twisted close and

tight around the plants, sapping and drawing the life from their hosts. In the dry upland Pines I found *Chrysopsis Mariana* in bloom, and the pretty blue flowers of *Diplopappus linariifolius* were also here, and looked charming with the yellow *Chrysopsis*.

It is quite remarkable how well the foliage appears on most all of the low-growing plants. Even in the dry barrens, where the white sand looks as if there was no moisture in it, plants seem as fresh and bright as if there had been copious rains. The root-leaves of the Rattlesnake-weed (*Hieracium venosum*) were vigorous, lying in flat rosettes on the ground, each leaf handsomely marked with purple and lighter shades, and making them very ornamental. One of the most interesting plants in the dry sand was little *Lechea minor*; it had grown in many forms, but had mostly assumed the shape of miniature trees, none over a foot in height, yet perfect mimics of their large neighbors, under whose shelter they grew. Some had round dense heads on slender stems; others were forked and branched to simulate the varied forms of forest-trees. And the coloring of the tiny leaves was beautiful, too. Some of the plants were still a vivid green, while others had taken on the bronze and purple of autumn. The grayish looking *Hudsonia tomentosa* was a near neighbor of *Lechea* and was fresh and thrifty; but we know the secret of the good looks of these plants, for their roots reach down deep to the level of constant moisture.

Another interesting plant not at all affected by the long drought is *Chimaphila maculata*. I found thick masses here and there, covering two or three square yards with bright variegated foliage, fresh and shining, and dry seed-pods held above the leaves on erect stems to remind us how charming they were in midsummer when covered with fragrant blossoms. This charming plant, if given the right conditions, can be grown on the home-grounds quite easily. It loves the shade, and if one has not the time or inclination to prepare a place for it, a few plants set beneath the dense shade of a low-growing evergreen will flourish and give great pleasure. Two of my near neighbors have both species of *Chimaphila* growing and flowering in perfection under evergreens where they never set the plants. In all probability they were in the ground when the trees were set, some twenty-eight or thirty years ago, when the place was fresh from the forest. At all events, here they are, with no care, as fine plants as I ever saw. But they are entirely hidden from view, and we can only see them when we part the thick branches of the trees. I am sure a mass of these plants can be grown where they can be seen, and I am preparing a place in an angle of the house where the sun cannot reach them, and they are to be planted in the same leaf-mold where they naturally grow.

The grass-like leaves of *Xerophyllum* do not seem to be at all affected by the drought, and the Pitcher-plants look as fresh as usual even in quite dry places. But the trailing *Arbutus* has suffered considerably, and the leaves of many plants are dry and brown, with long stems entirely dead. *Pyxidantha* is also shriveled and dead in many places.

The foliage is still clinging to many of the deciduous shrubs as well as to some of the trees. The *Vacciniums* are gorgeous in color, and so is *Leucothoë racemosa* and *Andromeda ligustrina*. This brilliant color, mingled with the deep green, shining foliage of the Laurel and Holly, makes lovely and effective passages in the Pines. The large leaves of *Magnolia glauca* are still green, and so are the leaves of the Alder (*Alnus serrulata*). The young Pines (*Pinus rigida*) are looking better than they have for several years past. Something has happened to their insect enemies, so that the trees that were not killed have made a rapid growth the past season.

The little bushy scrub Oaks (*Quercus prinoides*) are holding their foliage, while the acorns have mostly fallen. These acorns are small and round, all nearly of the same size, and when strung on stout linen-thread can be woven in many fanciful designs. At the base of the acorn-cup I often find clusters of little abortive acorns, which I have never seen in any other species.

The fruit of many plants is now at its best, and very handsome. *Baccharis* is one mass of plummy white pappus, and its leaves are still green. The Hollies suffered less than usual from the ravages of the rose-bug this season. The marauders left some of the flowers, too, so that we find berries here and there on the trees. The bright red berries of the Black Alder (*Ilex verticillata*) are abundant, and the grayish fruits of the Bayberry are clustered thickly along the stems among the shining and fragrant leaves. The Bitter-sweet (*Celastrus scandens*) has opened its orange-colored pods, displaying its pretty scarlet seeds. Several species of *Smilax* are full of clustered fruit that will remain all winter long, and the Poison Sumach

has hung out its whitish drooping fruit in tempting array, but, handsome as it is, it cannot be allowed admittance to our collection.

Vineland, N. J.

Mary Treat.

Gardening in the Confederacy.

IN the twist which war times gave to southern life no interest or vocation entirely escaped. Domestic economy was revolutionized. The blockade having cut off the supply of northern and foreign goods, a home-made substitute had to be contrived for every article of clothing, for articles for household and for farm use, and for every article of food except the plainest and coarsest. Wood took the place of sole-leather in shoes, and coarse homespun the place of daintier fabrics. Corn-meal supplanted wheat-flour, and sorghum-syrup became the national sweetening, finding its way into most of the products of the Confederate kitchen, from counterfeit coffee to pound-cake and ice-cream.

Gardening, of course, underwent a change along with other things. Northern-grown seed, which had now come into almost universal use, being no longer obtainable, every housewife was driven back upon the old-fashioned method of saving her own seed. There was a touch of irony in the fact that the few seeds brought in through the blockade were flower-seeds. The demands of the new household economy worked considerable change in the product of the garden. Okra then first came into general use, but I never knew a pod of it to be eaten until after the war, though some families doubtless used it much earlier. We grew it as a substitute for coffee. The dry seeds were collected, parched, ground and infused after the manner of the true Arabian berry. At first okra-coffee had numberless rivals—parched meal, dried sweet potatoes, wheat, rye, and even cotton-seed, persimmon-seed and dandelion-seed—but it finally, I believe, supplanted them all except rye, with which it maintained a strong and lasting rivalry. Not infrequently heated disputes would occur between advocates of these rival substitutes. In fact, some hard-time connoisseurs became so wedded to okra-coffee, sweetened with sorghum, that they were loud in resolves to drink no other even though returning peace should bring back the genuine coffee. And when I add that some of these resolves outlived the war a twelvemonth, it will be seen that there must have been a great deal of earnestness and sincerity in them.

The garden assumed in those scant times a tenfold importance, and great efforts were made to have good ones. The need was urgent that every possible source of food should be turned to account. The tithes and donations to the Confederate Government made deep inroads into all staple products of the farm. Besides the heavy Confederate and state taxes, a tenth of all non-perishable articles of food for man and beast was taken for the armies. What was left, beyond barely enough to feed the denizens of the farm, was liable to seizure on emergency by Government officers. The capacity of the farm was also seriously curtailed by the impressment of work-animals for the cavalry and artillery service and of the negroes as laborers on the forts and fortifications, and, to complete the disaster, the trained and trusted servants were generally the first to fly to the Federal lines. As a consequence, materfamilias had to conduct gardening operations under great disadvantages—sometimes with unskilled hands from the "quarter," oftener still with pickaninnies, scarcely more amenable to discipline than so many wild creatures from the woods.

The energy of the southern women triumphed here as it did over so many other obstacles. Vegetables enough were raised not only for home use, but to give to the numerous families of refugees, which every neighborhood was sure to contain.

Medicine was the scarcest of all scarce things, and, many of the country physicians being absent as field and hospital surgeons, recourse was had largely to such medicinal herbs as the garden could afford, and thyme, sage, horehound and other garden-grown herbs were largely depended upon in sickness. The general health of the people was never better than during these times of scarcity, and this happy result was doubtless largely due to the more general use of simple garden products for food, and the disuse of drugs.

Kittrell, N. C.

O. W. Blacknall.

If the fine art of landscape-gardening is to obtain its most certain and striking effects, it must devote itself to emphasizing natural characteristics. A true park is a place where art has enhanced natural effects, and it can be nothing else. Whatever contributes to better determine or to emphasize natural character is a resource of the art of landscape; whatever destroys, enfeebles or confuses that character the art forbids.—*Hirschfeld's Theorie der Gartenkunst, 1777.*

Plant Notes.

Celastrus scandens.

THIS plant, which is figured in our illustration on page 569, is one of those inhabitants of the forests of eastern North America which, for certain decorative purposes, can hardly be praised too highly, although American gardeners neglect it as they neglect many other beautiful native plants, because it does not come to us from European nurseries, and is not, therefore, expensive and fashionable. The climbing Bitter Sweet, or Roxbury Wax Work, as *Celastrus scandens* is usually called, is a plant that everybody can have, and so it is rarely seen in gardens, although there is no vine hardy in our climate which produces such beautiful and showy fruit or grows more rapidly and with less care.

In its native wilds *Celastrus scandens* climbs over rocks, bushes and trees, delighting in moist shady situations, and often sends its slender twining stems fifteen or twenty feet from the roots. The leaves are abundant, of good size, and of a lively green; the flowers are small, greenish yellow, partly perfect and partly unisexual on the same individual, so that every plant produces fruit. They are arranged in racemose clusters, which appear at the end of the young branches. In this arrangement of the flowers lies the chief advantage as an ornamental plant of the American over the Japanese species, which was figured some time ago in these columns (vol. iii., p. 550). In that species the flowers are arranged in sessile axillary umbels, and the fruit is completely hidden by the leaves until they fall, leaving the branches covered with the open capsules, which are smaller than those of *Celastrus scandens*. But in the case of the American plant, the inflorescence being racemose and terminal, the fruit-clusters, which are often from four to six inches long, stand up well over the leaves and make a great show for several weeks before and after the capsules open. In the late autumn the leaves turn clear bright yellow; and it is at this time that the climbing Bitter Sweet is more beautiful than in any other part of the year, as then the fruit displays its brightest colors and delights the eyes of every lover of nature by the brilliancy and harmony of its contrasting colors.

Celastrus scandens is an excellent plant for covering trellises, to ramble among strong-growing shrubs, or to drape walls and other unsightly objects. It is free-growing without being too rampant, and it is not at all particular about the character of the soil in which it is planted or about the exposure which is given to it. Seedlings are easy to raise, and it may be readily and quickly multiplied by layers.

Foreign Correspondence.

The London Chrysanthemum Exhibition.

ONE week of rain and another of yellow fog have been the unfavorable heralds and accompaniment of our great annual exhibition of Chrysanthemums. Still, bad though the weather has been and is, the flowers are, as a rule, first-rate, and the plants are equal to the best of previous years. Chrysanthemums are, after all, of the very best-tempered garden-flowers, and the conditions must be very bad indeed to cause them to fail. Exhibitions are now being held everywhere, even our smallest towns, and not a few villages, boasting an annual show of Chrysanthemums. The horticultural journals are consequently almost wholly given up to reports of them, and will continue to be so during nearly the whole of November.

Of course, the greatest of all these shows is that arranged by the National Chrysanthemum Society to take place at the Royal Aquarium, Westminster, in November. Here the prizes are valuable, and, as a consequence, the exhibits are from all parts of the country and of the best quality.

The cut flowers are this year, as before, the most sensational objects at this Chrysanthemum show, and, notwithstanding various efforts to break away from the practice,

the still generally adopted arrangement is on flat boards with holes in them for little flasks of water, each flower resting on its shoulders on the board. As a rule, the flowers, especially of the Japanese varieties, crowd each other. Bunches of flowers have been tried, but they do not please. It must be admitted that the Chrysanthemum as generally

the Japanese section, as shown in the various classes, I give their names: Aida, Avalanche, Baronne de Prailly, Boule d'Or, Carew Underwood, Coronet, Colonel W. B. Smith, Edwin Molyneux, Etoile de Lyon, Ethel Paule, Eynsford White, Florence Davis, Gloire de Rocher, Gloriosum, Hamlet, H. B. Ironside, Japonaise, Lord Brooke, L. B.



Fig. 97.—*Celastrus scandens*.—See page 568.

represented on the exhibition-stand is as wonderful as it is unnatural.

The most praiseworthy exhibit of flowers at the Aquarium was the first-prize collection of forty-eight large Japanese varieties, shown by Mr. W. H. Fowler, of Claremont. They were a grand lot, the size, form and finish of almost every flower being exceptional. As they represent the cream of

Bird, L. Boehmer, Madame Baco, Madame J. Laing, Mademoiselle M. Hoste, Miss A. Hartshorn, Monsieur Bernard, Monsieur Freeman, Mrs. A. Hardy, Mrs. E. A. Adams, Mrs. F. Jamieson, Mrs. J. S. Fogg, Mrs. A. H. Neve, Mr. D. B. Crane, Mr. E. Beckett, Mr. Williams, Puritan, Ralph Brocklebank, Ruth Cleveland, Stanstead White, Sunflower, Vivian Morel, W. W. Coles, W. Tricker, W. H. Lincoln

and three others of doubtful names. Other Japanese varieties besides the above, which figured in first-prize collections, were Belle Paule, Bertha Flight, Comm. Mraignon, Excelsior, Fair Maid of Guernsey, Madame C. Audiguier, Monsieur Astorg, Sarah Owen, Umpire and Val d'Andorre.

The first prize for six white flowers of a Japanese variety was awarded to a magnificent tray of Stanstead White, Avalanche being second and third. Six flowers of Vivian Morel won the first prize for a colored Japanese variety, the same variety being second, while Sunflower was third. Certificates were awarded to the following new Japanese varieties: Thrumpton (Tenard), a large dark bronzy red flower of good promise; Beauty of Exmouth (Godfrey), a glorified Florence Percy, which has already been awarded four first-class certificates. The flowers were fully six inches across, and pure white, the florets curiously curled as in the favorite F. Percy, which is one of the very best of the white-flowered kinds.

The incurved section was quite as well represented as the Japanese. The following kinds occurred in three or more first-prize collections: Empress of India, Golden Empress, Jeanne d'Arc, J. Lambert, Lord Alcester, Lord Wolseley, Miss M. A. Haggas, Miss V. Tomlin, Mrs. Heale, Mrs. S. Coleman, Princess of Teck, Princess of Wales, Queen of England. Three varieties, Miss V. Tomlin, Golden Empress of India and Mrs. S. Coleman, were included in no less than six first-prize collections. For six flowers of a white incurved variety Empress of India was a long way first, Princess of Wales being second. A new incurved called Robert Petfield (Owen) was awarded a first-class certificate, as well as the first prize for three flowers of one kind. It is not unlike Lord Wolseley in form and color, but paler. The large-flowered reflexed section was represented by Cullingfordi, Dr. Sharp, Chevalier Damage, Cloth of Gold, King of Crimson, Pink Christine, Golden Christine and Peach Christine. These occurred in several first-prize collections.

The large Anemone-flowered division was abundantly represented, the best of them being Gladys Spaulding, Lady Margaret, Thorpe Junior, Cincinnati, Nouvelle Alviolle and Fleur de Marie. The Anemone Pompons were shown in bunches, three sprays of each kind, not disbudded. The best of these did not seem to be first-rate, although the light in the building was so bad by the time I got to them that it is scarcely fair to express an opinion upon them.

The aquarium is roofed with "Duroline," a patent substitute for glass, and which is made of finely woven brass wire, thickly coated with a yellowish semi-transparent substance not unlike a thin layer of gutta-percha. It is durable, and allows a certain portion of light to pass through it, but the color of the flowers is affected by its yellow tint. This was most noticeable on Mr. Cannell's magnificent collection of flowers of Zonal Pelargoniums, which were of the most extraordinary colors as seen in the Aquarium, except when the gas was lighted. Duroline is a most useful invention, and I shall not be surprised to see it become of considerable service in horticulture, but as a roofing for buildings, in which flowers are grown or exhibited, it is not suitable.

Mr. Cannell's Pelargoniums were even better than any I have ever before seen from him. Immense trusses of large flowers, the petals thick and velvety, and the colors rich, as though they had been developed in July instead of under the influence of November fogs and bad light. I noted some of the best of them, and if any one wishes to have in November a rich harvest of most useful flowers I would recommend him to get a collection of these Pelargoniums, and, if possible, learn from Mr. Cannell or some other expert grower how they should be treated. The kinds I noted were Birthday, white, pale pink eye; Ethel Lewis, Beauty of Kent and Amphion, three beautiful soft pinks; Madame de Bourdeville, white, shaded and lined with salmon; Rev. E. Harries, large, vivid scarlet; Lady Brook, white, with a large eye and radiating lines of pink; White Lady, pure white; Stella Massey, flesh-pink; Mascagni,

flesh-colored, with a salmon eye; Sunbeam, deep salmon-red; Swanley Gem, scarlet, with white eye. Mr. Cannell showed about a hundred bunches, each as large as a man's head, and they were tastefully arranged upon an irregular bed of wood moss, the dark green of which had considerable effect in heightening the colors of the flowers.

Fruit, vegetables, cut flowers and table-plants were all represented by very fine collections. Messrs. Suttons' prize competition for vegetables raised from seeds supplied by them produced a great display of gigantic well-grown carrots, cauliflowers, leeks, potatoes and everything else good and seasonable in the vegetable line. Such exhibitions serve the purpose of a grand advertisement and at the same time give the general public some idea of the perfection to which vegetables may be grown. Of course, we must always bear in mind that a good show-vegetable is not necessarily a first-rate one for the table.

In conclusion, I may say that the best of the new Chrysanthemums at the exhibition was, in my opinion, Beauty of Exmouth, and the most striking in the whole of the collections were E. Molyneux, Vivian Morel, the greenish Florence Davis, and Sunflower. Of course, all the Queen family of the incurved kinds were supreme as ever. Messrs. Pitcher & Manda's prize of £20 for the best seedling raised from the exhibitor's own seed was awarded to Mr. W. Gilbert for a Japanese seedling unnamed. Other certificated new kinds besides those already mentioned were Dorothy Shea (Shea), a cross between E. Molyneux and Sunset; Mr. C. Shrimpton (Shrimpton), a chestnut-red Japanese variety; Charles Blick (Blick), rich yellow, with broad petals; Rosy Morn (Carter & Co.), a Japanese rosy purple, large-flowered variety; Ed. Lonsdale (Pearson), crimson Japanese; Brookleigh Gem (Caute), a purplish sport from Jeanne d'Arc; La Deuil (Jukes), a Japanese Anemone, flowered variety, large, full, crimson-purple.

London.

W. Watson.

Cultural Department.

Propagating New Strawberries.

OF all the occupations or pastimes of the horticulturist the originating of new varieties of Strawberries is one of the most fascinating. The method is so simple, and the result so speedy and apparent, that it never loses its charm. Besides, there is always a chance that something of real value will be produced.

With scarcely an exception all the kinds of any value now in use originated in the judicious crossing of different varieties, so as to unite as many good qualities and as few poor ones as possible in the same plant. Many had their origin at haphazard from the chance crossing of nature, but few have stood the test of time. The Hoffman was found growing in a hedge near Charleston, South Carolina, and it was a find of unusual value. While not perfection in itself, it may prove the variety from which the ideal berry of the future will be derived. It has size, color, firmness, and adaptiveness to different soils and climates in a marked degree; its extreme earliness is another valuable quality, and it needs only greater productiveness.

Varieties selected for crossing should have diverse merits, so that, if these merits are combined in a single seedling, this would have the greatest possible number of good qualities. This ideal berry will possess, in eminent degree, size, earliness, productiveness, flavor, attractiveness and firmness. The market gardener, as a rule, requires size, earliness, productiveness and attractiveness, and if he lives remote from market, also firmness, so that his berries will carry well. The amateur gardener above all desires flavor, with productiveness and size as close seconds, and with earliness and beauty not far behind. The Hoffman has good size and is early. In the Bubach, Sharpless and in other varieties flavor, or at least palatableness, as well as largeness and productiveness, are to be had. Possibly the long-sought berry may be an offspring of the Hoffman and Bubach, which possess, together, about every desirable quality.

To achieve this result my plan is to set a sufficient number of the pistillate Bubach plants in a Hoffman field where their blooms will be thoroughly impregnated by the pollen from

that staminate variety. If these operations are bounded by the limits of a garden, extreme care must be used to prevent the intrusion of undesirable pollen from other near-growing varieties. Nothing in nature is more subtle and penetrating than this impalpable dust. If other varieties than the two to be crossed stand within one hundred yards a sash should be used as a protection. This may be placed just before blooming-time over half a dozen plants each of the chosen kind set the autumn before. A camel's-hair brush is used by some

fourth of an inch deep. In watering, a sprinkler with a fine rose will prevent the washing up of the seed. Germination should begin in two or three weeks. When large enough to bear it, they should be transplanted, in wet weather, to good soil. With good soil and attention these plants will probably bear some berries the following spring, but nothing decisive should be expected until the second bearing season. Meanwhile, all runners should be clipped as fast as they appear.

The result of an experiment of this kind will be curious and interesting if it has no other value. While the berries of every plant will in some degree resemble one or both of the parents, no two will inherit exactly the same qualities or be precisely alike, and each will have its own distinctive qualities.

The desirable plants should be marked, or the undesirable ones may be destroyed. Those retained can now be allowed to produce runners at will, care being taken to prevent those from any two plants mingling, so that they cannot be distinguished. The runners from each separate original plant will bear the same kind of berries and constitute a new variety.

Kittrell, N. C.

O. W. Blacknall.

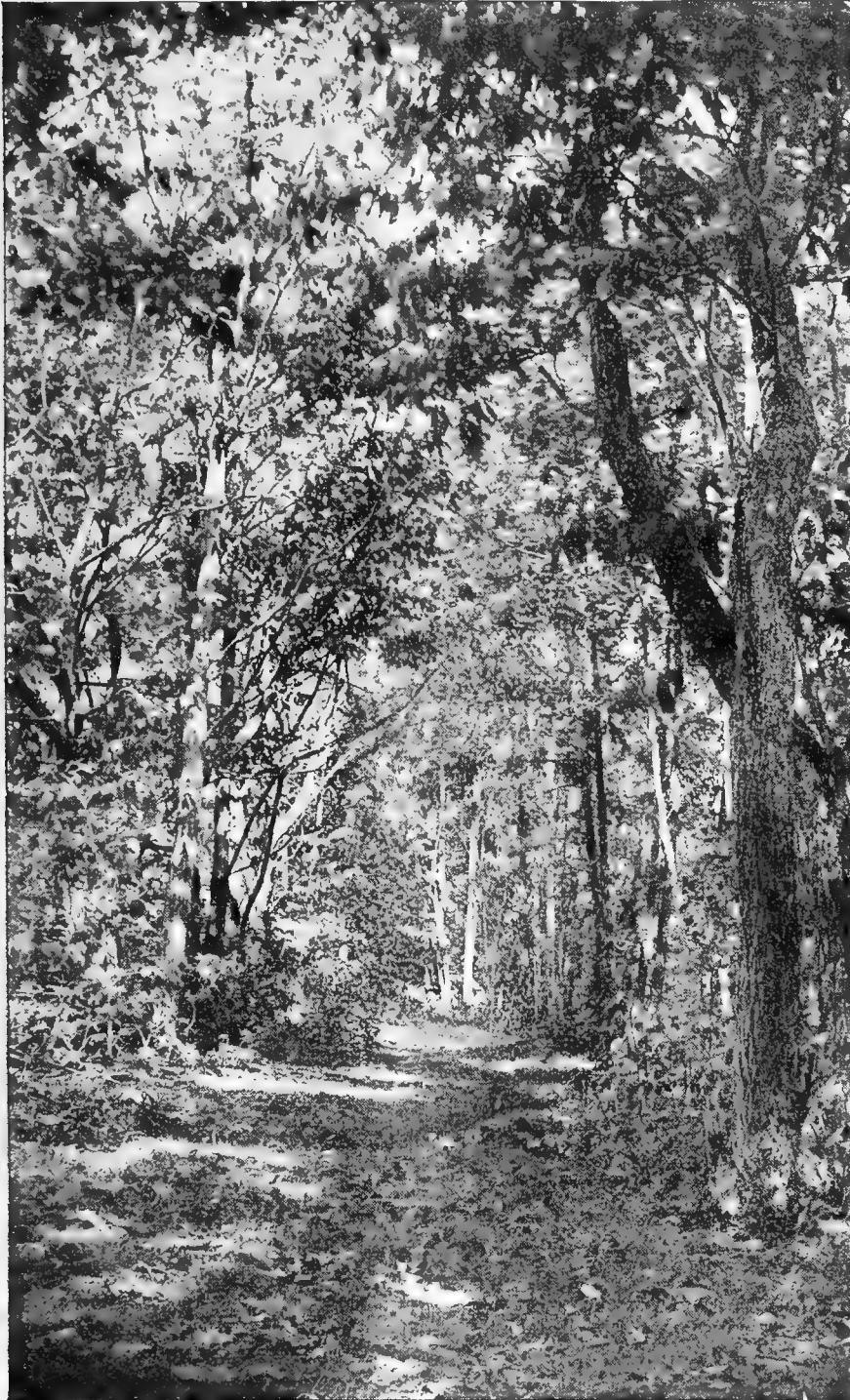


Fig. 98.—Road through a Chestnut Wood on Broad Top.—See page 566.

propagators to convey the pollen from the staminate to the pistillate blossom, the plants being kept in pots.

The berries once well "set," all danger of further intermixing is past, and, of course, no other preventive measures need be taken to keep out other pollen. From thoroughly ripe berries borne by these plants the earliest and largest should be selected. After the pulp is expressed the seed should be sown in rich, well-prepared soil, and covered with fine earth about one-

A few Notable Shrubs in late November.

THE Thursday of the last week of November is now generally looked upon as the Thanksgiving Day of the American people. In the south the frosts generally have not then caused any very great destruction of vegetation, and late autumn flowers may linger until Christmas. But in northern gardens, November frosts are usually frequent, and often very severe, and Thanksgiving Day brings with it few fresh flowers to be found in the open air. The Fall Dandelion (*Leontodon autumnale*), so common in our fields, is one of the most persistent plants in continuing to produce flowers in spite of frost, while Tansy and some others of the Composite family are more likely to maintain their freshness than any other class. Precocious flowers, not due until the following spring, are not very rare, and we sometimes find Dandelions in cultivated ground, Daphnes in our gardens, and, perhaps, *Epigæa* in our woods bearing a few stray flowers.

But it is the fruitage of certain shrubs which will attract most attention as autumn passes into winter, and probably the number of species available which possess this quality is not generally appreciated. Every one having any sense of color admires the abundant fruit of the common Barberry, which now grows so commonly along many waysides. But there are other species of Barberry, as yet unknown to the majority of gardens, which surpass our common kinds in the lasting beauty of their fruit. By far the best of these is the Asiatic *Berberis Thunbergii*, the bright red berries of which, being comparatively dry and juiceless, remain in perfect condition all winter, while the juicy fruit of the common Barberry becomes shriveled by frequent freezings and soon loses color and lustre.

For brilliant red color we have our native deciduous Hollies, or Black Alders, or Winterberries as they are also called. These thrive as well under cultivation as the Barberries, and may be taken directly from their native haunts and planted in the shrubbery if necessary. As they are diœcious—the male and female flowers being produced on separate plants—it is necessary that care should be taken to select fruiting plants in order to secure a crop of the showy berries. There does

not appear to be any great difference in the size and ornamental quality of the fruit of the common Winterberry (*Ilex verticillata*) and the smooth one, *Ilex lævigata*, but the berries of the former are usually more abundant, they ripen later, and they persist longer in a bright and showy condition. These and the Barberries might furnish enough of the bright reds in any group, but they may be augmented by still others of similar colors. Besides one or two more southern species with red or scarlet fruit which prove hardy in our northern gardens, there has been introduced to the Arnold Arboretum a Japanese species which is quite ornamental after the leaves have fallen, which they do early. This was received without a name some years ago from the Flushing nurseries of Messrs. Parsons, and from descriptions it appears to be the *Ilex Sieboldii* of Miguel. The fruit is much smaller than that of our native species, but is produced in abundance on slender branches and twigs. A peculiarity of these fruit-bearing twigs is that two of them are often produced from the axil of a leaf, one being superposed immediately above the other. This gives the shrub a particularly twiggy aspect. In striking contrast to the normal red or scarlet of the fruit of these different Winterberries is a clear, bright yellow-fruited form of *Ilex verticillata*, which was found some years ago near Andover, Massachusetts. It bears fruit in abundance and is singularly showy at this season.

The Burning-bushes, or species of *Evonymus*, are better known than most shrubs which are valuable for late autumn effects in color; but the closely allied Bittersweets or *Celastrus* are not often seen except where they grow wild. The native species, *Celastrus scandens*, with its deep orange pods and scarlet arils, is unlike any other species in cultivation, and in some respects is better than its Japanese congeners. As it is dioecious, care should be taken to procure stock by division from fruiting plants, for if the plant should be a staminate one it might grow rampantly and blossom, but would produce no fruit. The best known of the Japanese species is probably *Celastrus articulata*, which has much smaller berries than *C. scandens*, with yellow instead of orange-colored pods. It makes an excellent covering over rough places and rocks, as it is of rather rank free growth.

Roses of various species sometimes have fruit of quite an ornamental quality at this late season, and the hips of *R. Carolina* may be taken as an example. The Cotoneasters are a group of shrubs almost unknown in American gardens, probably because they are not conspicuous for flowers. The fruit of such species as *C. vulgaris* and *C. acuminata* remains of a rich purplish or reddish color after the leaves have fallen, while *C. Simoni*, still holding some of its foliage, has fruit almost scarlet in color. The purplish red fruit of the Chokeberry (*Pyrus arbutifolia*) is fresh enough to be ornamental; and although the large yellow Japanese Quinces have fallen, they perfume the air on a mild day if they have not already been gathered for making jelly, as they can be converted into a fairly good table dish.

The high-bush Cranberry (*Viburnum opulus*), too, is not to be overlooked, and, besides the brilliancy of its bright red fruit, it may also serve a useful end as a sauce in regions where the true Cranberries will not grow. The Coralberry, or Indian Currant (*Symphoricarpos vulgaris*), which is as common as a weed in some places, is deserving of recognition on account of its slender branches being laden with the small dark red or magenta-colored berries, in striking contrast with the large snow-white fruit of the allied Snowberry (*S. racemosus*), which usually does not keep its fruit so late into the winter. For a shining black fruit the Common Privet is unexcelled; and the large egg-shaped scarlet berries of the so-called Chinese Matrimony Vine (*Lycium Chinense*), hanging thickly on the long string-like stems, are a surprise and delight to every one who sees them for the first time.

Arnold Arboretum.

J. G. Jack.

Orchid Notes.

THE genus *Dendrobium* is so extensive that there are always some of its representatives in flower. *D. chrysanthum*, the golden *Dendrobium*, is just fading, after having been in bloom for the past six weeks. The pseudo-bulbs of this plant are long, pendulous and of medium thickness, and the flowers are produced with the leaves on those of recent formation. These are oblong-lanceolate, from four to five inches long, and of bright green color; and the deep yellow flowers, with dark brownish blotch at the base of the lip, are two inches across, borne on pedicels two or three inches long and in clusters of two or three at the nodes of the pseudo-bulbs. This species has two distinct flowering seasons, autumn and early spring, and it requires a warm-stove temperature. It should have

about three weeks of complete rest after flowering, and then, with heat and moisture, it will start into vigorous growth.

Dendrobium formosum is a remarkably handsome plant, now flowering freely. The stout pseudo-bulbs are well clad with deep green oblong leaves, bearing the large blossoms in dense racemose clusters of three or four at the apex. The flowers are from four to five inches in diameter, pure white, with a large irregular patch of deep orange-yellow on the spreading lip. This plant is, reputedly, difficult to manage, but its conduct here is quite satisfactory. It is rested moderately after flowering—that is, it is placed in a minimum temperature of fifty-five degrees, Fahrenheit, and kept sufficiently moist at the roots to prevent the leaves from shriveling. The plant is fully exposed to light and sunshine, and the surrounding atmosphere is kept as dry as possible. It is turned out of the basket in spring, and replanted with fresh rough peat, charcoal and sphagnum about the roots. Then it is placed close to the glass in a house where the average temperature is seventy degrees and the air is continually laden with moisture. This is maintained, with frequent applications of water, and shading from bright sunshine, until the new growth is completed, when the plant is again subjected to the cooler treatment until the flower-buds are well advanced. It is then given a slightly warmer place for the flowers to develop.

The flowers of *Cœlogyne fimbriata* are pretty, though not very showy. The plant is rare in gardens, but well worth cultivation, as it is ever green and fresh in appearance, and always blooms freely late in autumn. The racemes emerge from the apex of the pseudo-bulbs, and they are slightly shorter than the leaves. The peduncle bears three or four flowers about an inch in diameter, developed in quick succession from the base upward. The sepals are ovate-lanceolate, the petals linear, and both of a yellowish green color. The trilobed labellum is very beautiful. The lateral lobes are erect, the front one spreading and prettily fringed. The ground color is a trifle paler than the other divisions, and there are many prominent lines and patches of rich velvety brown on the upper surface. The blunt, curved column is bright yellow at the tip, thus completing a combination of color that would be called highly pleasing were the picture magnified a few times. The freedom with which the flowers are produced compensates for the deficiency in size. *C. fimbriata* is easy to grow, and thrives luxuriantly in a well-drained pot or pan, with peat-fibre and sphagnum about the roots. The sphagnum should always be kept moist. An intermediate temperature gives the best results.

Cambridge, Mass.

M. Barker.

Basket-plants for Window Culture.

THE cultivation of basket-plants in living-rooms is necessarily somewhat limited, from the fact that many species that show to advantage under this method of culture are not best suited in the dry atmosphere of a dwelling, for the soil in a basket will naturally dry out under such circumstances much more rapidly than pot-grown specimens, and in all cases the plants so grown, if in good health, will be found to require thorough watering frequently, the most satisfactory method being that of dipping the entire basket in a tub of water, and then allowing it to drain off in a sink or other convenient place before returning it to the window garden. There are, however, a number of species that will thrive under all these disadvantages, and prominent among them is *Othonna crassifolia*, a pretty little composite with bright yellow star-like flowers about half an inch in diameter. This is quite a rapid grower when placed in a sunny window, and soon covers a basket with a screen of its slender shoots, which are clothed with bright green leaves of very succulent character. It is readily propagated by cuttings, and it has the good quality of not being easily discouraged by slight neglect, and overwatering is more detrimental to it than an undersupply.

The Variegated Ground Ivy (*Nepeta Glechoma variegata*) is also a very useful subject for our purpose, and, though a common plant, it is one of real beauty, its small, kidney-shaped leaves being prettily variegated with white, while its growth is profuse under reasonably good conditions. This, also, is easily increased by cuttings, and, besides, being a good basket-plant, the *Nepeta* can be used to advantage for carpeting the surface of a window-box or for covering the soil around a large pot specimen—for instance, a large Palm or other decorative plant.

Fuchsia procumbens is another pretty little plant for house-culture, and of rather different type from the general idea of *Fuchsias*, being a trailing plant with small roundish leaves and erect tubular flowers, which are rather insignificant in size and yellow and blue in color. The flowers are succeeded by crim-

son berries, which remain on the plant for a considerable time, and add much to its decorative value. *F. procumbens* is a cool-house subject, and can, therefore, be grown in some windows in which more tender plants would suffer from the low temperature.

The Ivy-leaved Pelargoniums are also admirable plants for window-decoration, combining beauty of leaf and flower. Marked improvement has been made in the later introductions among this charming group. Among the older varieties *L'Elegante* still holds its own as a handsome variegated-leaved sort; in fact, it is doubtful if there is a finer-foliaged variety in cultivation, its combinations of white and pink found in the variety being most attractive. The chief improvement aimed at in the newer varieties has been in the flower, and much has been attained, both in single and double flowers, the foliage in most cases being bright green, and more or less marked with a bronzy zone.

It is scarcely necessary to note the value of German Ivy (*Senecio mikanioides*), the *Tradescantias* and *Saxifraga sarmientosa* for the purpose in view, their merits being already so well recognized for basket-plants, while their propagation is also well understood by all plant-lovers. Some Ferns can also be grown in window-baskets with success, two of the best for the purpose being *Nephrolepis exaltata* and *N. davallioides furcans*. Both are strong growers and withstand the dry atmosphere of a dwelling quite well, providing their roots are not allowed to get dry. They belong to the Sword Ferns, and have long, graceful pinnate leaves, often four feet long in large specimens, and as these plants send out stolons or runners, somewhat like a Strawberry, it is not difficult to increase them.

Holmesburg, Pa.

W. H. Taplin.

Chrysanthemums Naturally Grown.

NOW that severe weather has blighted the last of the flowers in the border it may be well to say something about the Chrysanthemum in the garden. The seasonable notes in the horticultural press mostly give only one phase of Chrysanthemum culture, that under glass, and generally the cultural directions are only meant to aid in the production of the largest possible flowers. From one point of view this is entirely satisfactory, but the owners of spare glass are few, and there are those to whom mammoth flowers are not all-satisfying. With the keenest appreciation of the best efforts of the cup-hunter, one feels, after visiting the various growers, that the matter becomes somewhat tiresome. Every one grows them on the same plan with not largely differing results, and to see one lot is to see them all. With all the variety in the houses of the grower of large flowers one could never gain an idea as to the abounding wealth of form and variety to be found in the family.

To one who loves a garden with all the flowers of the various seasons, the Chrysanthemums are indispensable for the ending of the floral year. There are no plants which, for the same care and attention, will give a more satisfactory and abundant harvest. They may be flowered in the garden in this latitude with temporary shelter, which may be arranged at slight expense, a necessity which they well repay. For some years I have so grown them, protecting them sometimes under sash, and sometimes under a tent. Hot-bed sash on a temporary frame are the most satisfactory, as a tent is a difficult subject to anchor and cools off too rapidly under a high wind. It is scarcely possible to secure exhibition flowers under such conditions, but one can easily obtain really fine blooms, and quite as large ones as are useful. Flowers so grown are mostly lacking in depth, which is only obtainable by culture where all the conditions can be controlled, with manuring, watering and like processes carried on without regard to conditions of outside temperature. Where they are partially exposed, there will, of course, be days when these attentions could not be given safely, and the plants have to be kept generally on the side of dryness after the middle of October. Flowers grown under these conditions, freely exposed to the air when the temperature is above the freezing point, though protected at all times from high winds, are to me the most satisfactory and enjoyable, as they seem entirely in character. After roughing it for about a decade with Chrysanthemums in the garden, those under glass seem to me about as tame as a deer in a paddock. There are many flowers which please me as well as the Chrysanthemum, but none which so excite or exhilarate me as these in a bright frosty October day. Under such conditions, with the beautiful forms, the wealth of color and the faint odor, they are fairly intoxicating. This is not an effect singular to myself, as I have noticed after some experience

with visitors. A few years ago, when my collection attracted some local interest, it first amused, and then puzzled, me to see very frequently rather indifferent visitors to the Chrysanthemum shows become enthusiastic over my flowers, which were only mediocre ones in comparison.

The explanation was simply that here they felt and were stirred by the real spirit of the flowers under their natural conditions.

For out-of-door culture the grower will find that some care will be necessary in selecting his varieties, those with not too thick a petal being the most desirable. Varieties with meaty florets are quickly ruined by a light frost, and in many of the modern varieties, favorites with the growers of lasting blooms are of this character. Otherwise one can scarcely go amiss in selecting according to favorite colors or types.

Elizabeth, N. J.

J. N. Gerard.

Sonerila Hendersoni.—The dwarf, compact habit and pretty foliage of this plant renders it very useful and telling in the outer line of a group of larger plants or along the margins of our stove stages. It first came into notice early in the seventies, and was at once stamped a popular favorite. In habit it is branching to an extreme degree, and the height seldom exceeds six inches, being often less than that. The ovate, opposite leaves, with short petiole, are from three to four inches in length, and closely arranged on reddish stems. The underside is light green, freely-marbled with reddish purple, and the upper surface rich dark green, suffused and dotted with silvery white, the spots being more distinct in the older leaves. The plant has an additional charm in the beautiful flowers, which are produced in large numbers during the autumn months. They are borne in three or four-flowered umbels at the extremity of the stems, thus having a most effective setting in the pleasing foliage. The peduncles are from one to two inches and the pedicels one-fourth of an inch in length, and the three-parted corolla, with oblong divisions, is of a deep pink color, and an inch and a half wide, the showy yellow stamens being arranged in a cluster in the centre.

Sonerila Hendersoni is extremely easy to cultivate. It is most ornamental and serviceable when grown in pans three inches deep and six inches across at the top. These should be well drained, and filled to within half an inch of the rim with a mixture of loam, peat, leaf-mold and sand, in equal parts. The soil should be pressed down firmly and covered with a light coat of sharp sand. In this cuttings should be inserted early in spring, placing them about two inches apart. The pans may then be stood in a close propagating-frame, where the cuttings will strike root in a short time. When the plants have fairly started into growth, they may be at once removed to the stove-stages. An average temperature of sixty degrees insures healthy development, and the plant likes a moist atmosphere and a position near the glass, with shade from brilliant sunshine in summer. The statements regarding the origin of *S. Hendersoni* are contradictory. Some authorities say it is a garden hybrid, while others class it as a variety of *S. margaritacea*, introduced from the East Indies in 1875.

Cambridge, Mass.

B.

Correspondence.

About Irises.

To the Editor of GARDEN AND FOREST:

Sir,—It has seemed to me that the Iris is a flower of such variety and beauty, of such hardiness and ease of cultivation, of such value in a formal garden or in wild plantations, as to rank but little below the Rose in its interest to amateurs, yet, so far as I am aware, there is no good comprehensive treatise on the genus, while Rose-gardeners may select their books of instruction from a long list. I have thought that a comprehensive treatise ought to be prepared for American growers of the Iris, which should give specific information in regard to the treatment of the separate varieties, and should be in such a form as to make a pamphlet or small book when gathered together.

Some days since I was talking to a prominent amateur about the advantages of the Iris, and he said to me, "What a pity that their season is so short." But we can cut the superb blooms of the Mourning Iris in May, and those of the Kämpfers and others until August; there must be a way of so choosing and planting our varieties as to give us flowers for nine or ten weeks. We may not be able to get a continued succession of blooms in the same location, on account of the different treatment demanded by different species, but we

should be able to supply our houses with the exquisite flowers for at least two months. Those who have only seen the Iris in a formal garden, or even in a mixed border, can form no idea of its value and beauty in the wild garden when it thrusts up its bloom on the bank of some quiet pond, to be reflected in the clear water, or mingles its flag-like foliage and exquisite flower-colors with the rank growth of a swampy nook.

All who have grown Irises have felt the want of reliable information. Those who have not should have their attention drawn to a source of horticultural pleasure about which it would be difficult to say too much.

Westbrook, L. I.

C. B. W.

[The desire here expressed for information as to this interesting family of plants is likely to be soon gratified to some extent by the publication of a handbook of the *Irideæ*, by Mr. J. G. Baker, which we believe is now in the press. Such a handbook has long been much wanted. Information as to the Iris has been hitherto found mostly in the form of monographs or notes in the horticultural papers, or in "the proceedings of societies," or, in a scientific way, in the encyclopedias. The letter of our correspondent emphasizes the fact that in gardens usually the only Irises known or grown are the hybrids or so-called German, the Japanese, and possibly sometimes the English and Spanish. This is in spite of the fact that these plants have always been special favorites with the lovers of hardy plants, in whose gardens the Iris occupies the place corresponding to that occupied by the Orchids in collections grown under glass. While the Irises are not exhibition flowers and not adapted to making a stir among those who esteem flowers according to their exhibition value, the possessor of a good collection from the hundreds of species of the genus finds them perennially fascinating, usually a feast to the eyes, often of great interest botanically, and very frequently most difficult subjects to flower successfully. Our readers will recall the fact that we have given much space to these flowers; that we have noted the flowering of numerous varieties; have kept up a current history of the Iris season from February till late summer, after which there is a dearth of bloom outside till Iris *stylosa* puts out its flowers in early winter. Numerous Irises are not hardy here, but in the cool house the season can be continued till frost again slightly loosens its hold. One who is fond of plants or flowers which will ornament his garden in all seasons, and who yet wishes mental recreation in collecting and studying variations of species, will find in the Iris an abundant and interesting occupation which seems practically limitless, as new species are constantly being discovered. The genus, too, offers an almost untrodden field for the hybridizer, as work of this sort has as yet been attempted with very few of the species.—Ed.]

Dolichos Japonicus.

To the Editor of GARDEN AND FOREST:

Sir,—The article in your issue of October 26th on *Aristolochia Siphon* leads me to say that I have found *Dolichos Japonicus* a more satisfactory vine for trellis or wall or brush-heap, since it is a more rapid grower and the leaves have a remarkable beauty in their shades of green. I have had it in different locations during five years past, and the only trouble has been that it has outgrown all accommodations provided for it, running rampant and throwing out in all directions its feelers or tentacles, for it almost seems to have animal intelligence, to embrace and cover everything within its long reach. Three vines now cover the tower of my house, running up over forty-five feet. By fixing a point of departure this vine could be fairly seen to grow, as an hour-hand on a watch can be seen to move by careful watching. Some days showed over thirteen inches of new growth! These vines were on the corner, where they are simply to run around a balcony at the first floor. It is not a good "architectural" vine for fronts of houses, but this year I gave it rope up to the loggia, and it was not satisfied with that, and would, I think, have romped clear over the top of the tower-roof if it could have got a leader up over the eaves. The blossoms of this Bean are purple and lavender, but show only from inside; and, by the way, the inside is, without question, the most desirable place to enjoy the vine,

as the light coming through the leaves brings out the delightful greens of the foliage. A rear piazza, therefore, covered with it would become a well-protected light green bower.

Hartford, Conn.

A. H. Olmsted.

[This plant was one of the introductions of Thomas Hogg, which has been sent out by nurserymen under the name of *Dolichos Japonicus*, a name which was once applied to *Wistaria Chinensis*. The plant is, without doubt, *Pueraria Thunbergiana*, an Asiatic twiner of very rank growth. In New England it rarely flowers, and, unless well protected, the stems die to the ground in winter. In milder regions they would survive, since they are distinctly woody, though soft and pliant. Mr. Thomas Meehan writes that his plants in Germantown formerly died to the ground, but within the last few years some ten or twelve feet of the vine have survived the winter. The plant was at one time called *Pachyrhiza Thunbergiana*, and it has had several other synonyms.—Ed.]

Wood Roads on Cape Cod.

To the Editor of GARDEN AND FOREST:

Sir,—The following words, which occur in Professor Shaler's article called "The Betterment of Our Highways," printed in the October *Atlantic*, are of special interest to us dwellers near Cape Cod. "Many of the worst roads in this country," he says, "are brought into their abject state by an unreasonable interference with natural processes—an interference which arises from an ignorant prepossession that all roads should have the same general aspect. Thus, in sandy regions, such as those in south-eastern Massachusetts, and in many other districts near the southern margin of the area occupied by the ice during the last glacial period, the first wagon-roads belonged to the class which we may call trackways, in which the path was just wide enough for a single vehicle, with occasional turn-outs to permit wagons to pass each other. On these trackways a single pair of parallel ruts were quickly formed, the growth of bushes and low forest-trees pressing so close to the roadway as to form a wall of foliage on either side. In many cases the crease made by the hubs of the wagons could be distinctly traced in the thick-set vegetation. Roads of this description afforded excellent wheeling and were maintained almost without cost. The falling leaves and small branches were swept into the ruts, and there mingled with the sand, forming a compact and elastic foundation for the wheels. The sandy soil permitted the rain-water quickly to drain away, so that no gutters were required. Although an unreasoning desire for improvement has led to the widening of almost all these old-fashioned trackways, we may here and there find bits which have escaped the merciless hand of the uneducated road-master. The present writer is accustomed frequently to pass over a stretch of road which was originally all of this nature; but a part of it has been altered to the regulation width of forty feet, while another portion remains in its primitive state. On the improved road the constantly shifting sands are not readily to be passed over by a pair of swift horses drawing a light wagon at a greater rate than six miles an hour. On the more ancient and natural type of way it is easy to attain twice that speed."

If Professor Shaler will come to the shores of Buzzard's Bay next summer, I shall be delighted to show him miles upon miles of these old-fashioned wood-roads, untouched by improvement, and unprovided even with turning-out places, the rather wide spacing of the trees in most places permitting one's infrequent opponents (I do not know what other word to use) to turn out comfortably enough into the low growth of bushes. I put the matter in this way, as a deserved tribute to the chivalry of the farmers of this region, for I have very rarely found that, when they saw a lady driving toward them, they were willing to lay even half the task of turning-out upon her.

There are, I say, very many miles of these roads in this neighborhood, running in all sorts of criss-cross directions between the greater and the lesser highways. As each stretch usually serves only one or two retired farms, which produce little but poultry, market-produce, hay or firewood, there seems little danger of their immediate "improvement." But some are more important and therefore more in danger, and so I offer my little appeal for them as a postscript to Professor Shaler's more influential one. These roads with their three ruts, one worn by the horse and two by the wheels, often with tall grasses and flowers growing between them, afford far better "wheeling" than most parts of our highways. "The

roads here are so poor that I don't care much about driving," says many a new-comer. "They seem so to you," we old-timers reply, "because you probably keep to the highways." "Of course," is the answer, "the less important roads must be even worse." In a city man this reasoning is natural; but it is greatly mistaken. Many of our woodland roads are quite delightful to drive upon; and taken altogether they are better than are our high-roads as a whole, although here and there, near the towns, we have some good solid bits of highway to show. Only, if Professor Shaler comes to try them, he must be content with my one-horse buggy. He must not bring his own pair of trotters. For—as I think I have already told the readers of GARDEN AND FOREST—our wood-roads have their three ruts very clearly defined by the passage of vehicles, mostly belonging to small farmers. A pair of horses can traverse them without great discomfort; but they are meant for a single steed; and the pair is apt to do much damage to the pretty alternating ribbons of grass, Golden-rod and Aster! And, as Professor Shaler knows, our axles are eight inches wider than the axles of Boston Town; so that, in his own carriage, he could profit by only one of our three comfortable shallow ruts.

Marion, Mass.

M. G. Van Rensselaer.

The Niagara Reservation.

To the Editor of GARDEN AND FOREST:

Sir,—The botanist who visits Niagara Falls is constantly attracted away from the striking features of the river and cataract to admire the remarkable development and variety of the plant-life that is everywhere manifest. Especially is this true on Goat Island, which is now one of the few spots in this vicinity that are covered with primeval growth. It is probable that even here the earlier timber has been removed, for that which remains is not very large, but the absence of stumps shows that no cutting of trees has taken place for a long time. The timber is chiefly of the ordinary hard-wood trees, Beach and Maple predominating, with an occasional Oak, Ash or Tulip-tree, and near the paths many small Cedars, white and red, Hemlock and prostrate Yew-bushes.

The long period of neglect which preceded the erection of the Falls into a state reservation was favorable to wild growth, and it is the avowed plan of the present management not to "improve" the locality more than the necessities of travel require, still there is evidence this year more than ever before that the gardener is at work here and there, and may sometime enter upon a warfare against the wonderful wild growth of Goat Island. It is at the close of a fall like this one that the region is most attractive. Up to the last week in October not a leaf had been touched with frost. Though not so brilliant in hue as autumn leaves become under frost, the yellow hues were everywhere, and in great variety, while the Sumachs, which form a grove on the south-east of the island that is striking at any season, do not wait for frost, and produce reds and yellows that are fairly flaming.

It may be said almost literally that no wild plant known hereabout is lacking to the flora of Goat Island, and especially is this true of plants of the more wayward and vagrant tendencies. In few other places does the Wild Grape climb so high or spread so far or swell itself into such tree-like proportions. Nowhere, especially on the American side and in the vicinity of Luna Island, is the visitor out of sight of these rampant vines. The slope leading down to Luna Island is covered with small trees so overgrown by vines that one wonders how the trees can grow at all, yet they appear to thrive under the load.

If the Grape-vines are without fruit this fall, it is not the case with other wild plants on Goat Island. The Virginia Creeper, Bitter Sweet, Waahoo and Barberry are purple, yellow and scarlet with berries, and grow as though this were their chosen home of all the earth. The Barberry here, especially, illustrates the tendency of certain plants to keep away from cultivation. By far the finest specimen on the island hangs so far below the Luna Island stair-landing that it is unsafe to try to gather the rich clusters of scarlet berries, while a bush on the roadway that has been planted and given some cultivation is far less vigorous and seldom bears more than one or two berries on a single stem. The largest Bitter Sweet clusters hang far over the western bank, growing in very indifferent soil, and the Waahoo is best content where left entirely to itself.

Goat Island contains a deep and mostly rich soil, which most of the other islands do not, and it will always retain its remarkable flora if the state officials will let it alone. Their terracing operations in the vicinity of the cottage near the entrance of the island, and the thinning out of the trees between Luna Island and the Biddle Staircase, look extremely ominous. If they go much farther, it will be time for the lovers of nature

to cry out. Already the erection this year of a monster pile of brick work, the first of many factories that the great tunnel must attract if it succeeds, presages the day when the town, even now rapidly growing under the new inspiration, is to be a manufacturing centre, with Goat Island for its chief breathing-place, so that the town, as well as the world at large, will be greatly the loser if the island is robbed of a single one of its distinctive natural attractions.

Buffalo, N. Y.

John Chamberlin.

Periodical Literature.

In the current quarterly number of the *Journal of American Folk-lore*, Dr. D. G. Brinton gives his recollections of a childhood spent in the southern portion of Chester County, a few miles north of "Mason and Dixon's Line," the time being about forty years ago. It was a region of large farms, cultivated by negroes, many of whom had come from the adjacent slave states, the white population being almost entirely American-born, and the general intelligence being above the average in the state, owing to the interest in popular education taken by the original settlers, who belonged to the Society of Friends. Much of the folk-lore of the region, says Mr. Brinton, could be traced to the negroes, but some of it had other sources. "Thus many of the farmers observed the phases of the moon in the planting and sowing of crops, in felling timber, in cutting weeds, in the renewal of their live stock, in the preparation of the soil, and in the killing and curing of meat for food." There can scarcely be a doubt, he explains, that these superstitions "descend directly from that remote period when the moon was the goddess of moisture, the field, the growing crops and reproduction in general. Just such superstitions prevail in France, and the eminent Arago thought it worth while to direct a treatise against them. Many of the superstitions which Grimm narrates as occurring among the Scotch and north Germans, were familiar beliefs. . . . If it was desired to extirpate weeds and briars so that they should not sprout again, they must be cut down in the wane of the moon. For some allied notion it was the custom to cut trees for use as firewood in the wane of the moon, as the timber cured more soundly and was less apt to become soggy and sputtery. The latter is also a Scotch superstition, as there is a Lowland agricultural maxim, 'Cut wood when the moon is wadel,' the word 'wadel' meaning disappearing, diminishing or waning. Jacob Grimm, in his *Teutonic Mythology*, after bringing forward a mass of kindred superstitions, offers the general theory that, in folk-lore, operations requiring severance, dissolution, cutting down or removing from, promise best results if conducted in the wane of the moon; while those of an opposite character are appropriate to the new moon." Thus planting operations are best performed while the moon is waxing; but, in his natal region, says Dr. Brinton, "by some it was held that the sign varied with the nature of the crop to be planted. Root crops, such as Turnips, Potatoes, Carrots, and the like, which ripen their edible portions beneath the soil, should be planted in the wane of the moon, or, as the local expression was, in the 'sinking' sign, in contradistinction to the 'rising' signs, which were those of the increasing orb. Even such a matter as fence-building should be carried on with due respect to these potent influences. A fence should be constructed in the 'rising' signs, for if the posts be planted and the corner-stones which support the rails in a worm-fence be located in the 'sinking' signs, the former will rot more readily, and the latter will sink into the ground and allow the bottom rails to decay."

The community in which Dr. Brinton was brought up was by no means peculiar in this respect, for these same superstitions were prevalent in all the middle states, at least. In one agricultural community with which we are familiar, not fifty miles from this city, all the farm operations were made to conform with the supposed influence of the various phases of the moon, or, rather, of these phases in connection with the signs of the zodiac, so that the almanac was the ultimate authority in almost all matters of farm practice. Not only was it supposed that rail-fences were to be constructed at certain periods of the lunar month, but no one laid a stone wall in the "new of the moon," through the apprehension that the frost would heave it, and it was a matter of universal belief that if Lima or Pole Beans of any kind were planted in the "old of the moon" they would never climb or fasten themselves to the supports provided, but settle down in a tangled mass on the ground.

Notes.

There must be still a good many woodsmen at work in the forests of Michigan, since from Menominee alone 600,000,000 feet of lumber have been shipped this year.

About \$40,000,000 is paid every year in Germany for the creation and preservation of forests; 200,000 families are supported from them, while something like 3,000,000 find employment in the various wood industries of the empire. The total revenue from the forests amounts to \$14,500,000, and the current expenses are \$8,500,000.

Monsieur H. Correvon, Director of the Alpine Garden of Acclimatization at Geneva, who is doing so much to rescue Alpine plants from extinction, has issued the prospectus of a monograph on hardy Orchids. The work will be illustrated by numerous engravings and will be furnished at the low price of three and a half francs.

Last week we spoke of a new Chrysanthemum which received the prize as the best pink at the Philadelphia show under the name of Magnet. This name has already been given to one of Mr. W. K. Harris's seedlings, which was distributed by H. Waterer, and the new Chrysanthemum has therefore been named J. J. Cliffe.

The agricultural experiment stations of the various states published last year, in addition to their annual reports, 225 bulletins, which were mailed to 340,000 addressees. In this way 35,000,000 pages of reading-matter were distributed among the people of the country, and a great part of the same matter was still more widely spread by the newspapers which quoted it.

A touching old rural custom still prevails in the western parts of France during the harvest-season. On the edge of a field bordering the highway a sheaf of grain is left standing, to which all the peasants of the village contribute, and which is called "the stranger's sheaf," as it is the property of the first tramp or other homeless wayfarer who may care to carry it away and profit by its price.

One of the famous White Oaks of New Jersey stands in the Presbyterian churchyard at Basking Ridge. It measures fourteen feet four inches in circumference at five feet high, while the branches shade a circle 115 feet in diameter. It has been a famous tree for more than a century, and it was, no doubt, a noble specimen in 1730, when the log-church was built on the ground where the present one now stands.

Professor B. D. Halsted, of the New Jersey Agricultural College, has prepared samples of the seeds of one hundred species of American weeds in metal-capped vials, which are arranged in four rows of twenty-five each in a tray, each vial in its own pocket and with a printed label. On the inside of the tray is a label giving a list of the hundred weeds with their botanical and common names in the order of the families to which they belong. The usefulness of such a set of seeds ought to be evident, since by means of it the foul seed in commerce can be readily identified. The sets were particularly made up for experiment stations and seedsmen, and one of them is sold complete for \$10.00.

The oldest horticultural association in Europe is the Royal Society of Agriculture and Botany of Ghent, established in the year 1808. Its annual exhibitions are always of great interest, and every five years it holds international exhibitions, the thirteenth of which is announced to open on the 16th of April next and to close on the 23d of the same month. No less than 660 classes of exhibits have been determined upon, associated in twenty-six great groups; and the prizes will be of unusual value, chief among them being the Queen of Belgium's prize, a large gold medal, for "twenty-five different species of hot-house plants in flower," and the King of Belgium's prize, a similar medal, for "the most varied and meritorious collection of 100 exotic Orchids."

Monsieur Ledain, the director of an agricultural school in Brittany, has asserted that moles may be poisoned by means of live earthworms which have been sprinkled with nux vomica. The worms, he says, should be collected and left in peace for twenty-four hours to disgorge the earth they have swallowed. Then they should be put in a jar and sprinkled with the drug in the proportion of thirty grains to a saucerful of worms. Twelve hours later they will be ready for use; and then they should not be touched with the fingers, but taken up with little wooden pincers and put at the entrance of the mole-galleries, being covered with clods or bits of tile in order that the mole may not be alarmed either by a current of air or a ray of light.

The Proceedings of the Convention of the Society of American Florists last year, at Washington, have been published in an instructive pamphlet of 170 pages, of which about fifty are

taken up with a review of new plants. The plants mentioned are by no means new, many of them, indeed, having been well known for a long time. The value of the review lies in the fact that it is made up of contributions from several different men, each one of whom gives a list of the class of plants with which he is familiar. Each one, too, has named such plants as seemed to him worthy of mention, together with brief descriptions. Of course, these descriptions vary in merit and the lists vary in range, so that there is little unity in the review. Although it is not so valuable as it would have been if it had been edited or compiled by a single person, and upon a definite plan, it is yet very interesting and has considerable permanent value.

An English horticultural journal recently recommended, as a novel manner of ornamenting dinner-tables, that branchlets of Birch should be thoroughly wetted and then whitened by being thickly sprinkled with flour, that these should be grouped in a central pot, and that flowers treated in a similar way should be dispersed about on the table. *Le Jardin* and another French journal have quoted this advice with approval, saying that such snowy decoration must produce a very cool and pleasant effect, especially in hot weather. But to an unsophisticated transatlantic taste they sound almost as inartistic and quite as inexcusable as flowers dyed to an unnatural color. Surely foliage and blossoms encrusted with white paste cannot make a really beautiful effect, while in the hottest weather there can be nothing more cool and pleasant to the eye than arrangements of naturally white blossoms, or even of delicate sprays of green leafage, accompanied by no flowers at all.

About five tons of the seed of a yellow Onion are annually produced in the state of Oregon. The yield varies with the soil and season, and the presence or absence of mildew, which is the only disease, so far, to which the crop is subject there; but an acre will yield on an average 500 pounds. In harvesting, the heads are cut off separately and let fall into baskets, and when these are full they are emptied into sacks which are placed upright at suitable distances apart. When filled the sacks are conveyed to drying-sheds, and the heads are spread thinly on platforms that are raised above each other, six or seven high, where they remain for a week or two till nearly dry. They are then taken into the sunshine and spread on large cloths for a few hours, when they are ready for threshing. Threshing is usually done by barefooted horses on a tight floor, and the seed is winnowed out through a mill and afterward washed in clean water, so that the light seed can be skimmed off and removed. The heavy seed is then taken out of the water, dried quickly to prevent sprouting, fanned once more, and it is ready for market.

A recent number of the *Revue de l'Horticulture Belge* declares that at the exhibition of the Royal Agricultural and Botanical Society of Ghent, which was to open on the 13th of November, an interesting surprise would be presented to lovers of Chrysanthemums. "Inspired, it seems," says the writer, "by the example of processes in vogue in China, an amateur of Ghent, Monsieur Alexis Callier, has grafted Chrysanthemums on *Anthemis frutescens*, and the result he has attained is so extraordinary that this mode of culture will revolutionize the world of chrysanthemophiles. To-day we will simply cite a few facts, promising more detailed information after the exhibition opens. The variety Val d'Andorre, for instance, which was grafted in February, has attained a height of five feet eight inches, while its head is six feet eight inches in diameter and bears 380 budding shoots. An Etoile de Lyon, with a head five feet in diameter, shows 150 budding shoots. A variety with large white flowers, grown from seed by Monsieur Callier, measures about seven feet in height, and is likewise a mass of buds; and a Paul Fabre will carry not less than 300 of its bright red, brilliant blossoms. This variety was grafted in April."

Catalogues Received.

ORANGE JUDD Co., New York; Rural Books.—HARLAN P. KELSEY, Highlands Nursery, Linville, Mitchell County, N. C.; Wholesale offers of Native North American Ornamental Plants.—WM. PARRY, Parry, N. J.; Small Fruit Plants, Fruit, Nut and Ornamental Trees.—F. S. PHENIX, Bloomington, Ill.; The Lincoln Pear.—PITCHER & MANDA, The United States Nurseries, Short Hills, N. J.; Selected Novelties of Chrysanthemums.—REASONER BROTHERS, Royal Palm Nurseries, Oneco, Fla.; Tropical, Semi-tropical and Hardy Fruit and Ornamental Plants.—FREDERICK ROEMER, Quaedlinburg, Germany; Novelties in Flower Seed.—MRS. THEODOSIA B. SHEPHERD, Ventura-on-the-Sea, Cal.; Wholesale Trade List of New and Rare Seeds, Bulbs, Plants and Cacti.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLES:—The Defacement of Scenery.....	577
Llewellyn Park. (With figure.).....	578
Notes of a Summer Journey in Europe.—XIX.....	F. G. Jack. 578
Botanical Notes from Texas.....	E. N. Plank. 579
NEW OR LITTLE-KNOWN PLANTS:— <i>Prunus tomentosa</i> . (With figure.)..	F. G. Jack. 580
FOREIGN CORRESPONDENCE:—London Letter.....	W. Watson. 581
CULTURAL DEPARTMENT:—The Cherries of North-eastern Europe,	
<i>T. H. Hoskins, M.D.</i>	583
Winter Protection.....	E. O. Orpet. 584
Flowers in the Conservatory.....	T. D. H. 585
Orchid Notes.....	M. Barber. 585
Notes from the Harvard Botanic Garden.....	M. Barber. 585
CORRESPONDENCE:—A Spurious <i>Elæagnus longipes</i>	N. A. Lindsey. 586
Flowers at Wellesley.....	Casual. 586
The Use of Cultural Directions.....	G. 587
Horticultural Education.....	Professor L. H. Bailey. 587
NOTES.....	587
ILLUSTRATIONS:— <i>Prunus tomentosa</i> , Fig. 99.....	581
Main Entrance to Llewellyn Park, West Orange, New Jersey, Fig. 100.....	583

The Defacement of Scenery.

A FEW days ago *The Tribune*, of this city, published a letter from a correspondent whose sensibilities had been outraged by the sight of a staring advertisement painted on the face of Storm King, on the Hudson. The writer desired to know whether there was no body organized for the purpose of stopping vandalism of this sort, and he was informed that no such association existed, although a law had been enacted in this state which made the defacement of scenery a misdemeanor, punished by fine or imprisonment. But laws, however stringent their provisions, are of very little avail unless they have strong public opinion behind them, and the great mass of our people do not seem to resent it as a personal injury when the natural beauty, which it is their right to enjoy, has been marred or obliterated to serve some private purpose. Not long since, within the limits of this city, and on grounds controlled by the Park Department, the rocks were covered with violent invitations to purchase somebody's stove polish and to swallow a particular kind of liver pill, and no protesting voice was heard. Our public highways and pleasure-grounds, as well as private places, are amply protected against invasions of this sort, but public officials and private owners rarely assert their rights. It is a misfortune that there are men who are willing to make every pleasing prospect hideous for the sake of advertising a nostrum in which they have a proprietary interest. It is a much more disagreeable fact that the public sentiment on this subject is so feeble that no effective protest is made against it.

The same number of *The Tribune* which contained the letter spoken of also contained a paragraph to the effect that the higher slopes of Greylock Mountain were being rapidly stripped of their forest-growth, and that the inhabitants of the surrounding region were distressed because the mountain views were thus robbed of their attractiveness. It was also stated that the portion of the mountain thus denuded was owned by some association and held as

park property. We know nothing of the facts of the case, but everybody knows that destruction of this sort is going on almost everywhere where there is a mountain or a forest, and that the men who are sweeping away these woods are turning scenes of beauty into scenes of desolation more rapidly and completely than this can be achieved with an advertiser's paint-pot. Now, it is not to be hoped that all our forests can be left standing to satisfy the æsthetic sentiment of a portion of the community. Lumber must be had from some source, and men who own timber-trees have a perfect right to sell them for economic use. At the same time it is undeniable that many places could be named where, even in a pecuniary sense, the trees are worth more to look at as they stand than they will be after they are sawed up into lumber. We have so often spoken of the money value of attractions of this sort that there is no need to enlarge upon the subject, but it may be added that there is no reason why certain forests should not be worked so as to yield the highest product possible and yet retain their beauty as portions of the landscape.

The simple truth is, that few persons ever think of natural beauty as a possession worth considering by "practical" men, much less as a public possession which it is a patriotic duty to preserve and transmit to posterity. Few persons look upon the natural landscape-beauty of the country as a factor in promoting mental and spiritual health, as well as a source of elevated pleasure. And yet it is strictly true that this is one of the functions of beautiful scenery, and if the people hold any inherited rights in blessings of this sort, the destruction of such beauty is a public offense akin to that of poisoning the free air or polluting the general water-supply. An occasional spasm of indignation against the advertiser's agent who irreverently lifts his hand against a few stones and fences may be an encouraging symptom, since it shows that there does exist among us a slumbering sense of the right of the people to the enjoyment of natural beauty. But, after all, the advertising-man is a petty offender when compared with many great corporations. What wealthy company was ever known to make the slightest effort to protect the scenery from unnecessary defacement in locating or constructing a railroad? What corporation ever takes thought to preserve the fair face of nature from needless scars when opening a mine or working a quarry or building a factory? How many lakes in the Adirondacks, and how many reservoirs elsewhere, are surrounded by a fringe of death, as the water has risen and drowned the roots of the trees on their banks, and who took any thought to prevent this hideous and depressing effect when the dam was built?

Of course, civilized man must have mines and quarries, reservoirs and railroads. Constructions of this sort necessitate some displacement of the elements of beauty in scenery; but they need not inflict frightful and incurable wounds, and if their owners and builders had a proper respect for the rights of others the defacement would in most cases be trivial. Works of this sort could often be made, under artistic direction, to beautify rather than disfigure the scenery, so that each generation would leave the earth to its successors a more attractive place for human habitation. Societies for preserving natural beauty have been formed in more than one European country, and they will be organized here with increasing enlightenment. They are needed for wider duties than the protection of the unparalleled grandeur of Niagara from vulgarization or the preservation of the forest-crown of conspicuous mountains like Greylock, or the rescue of Storm King from vandal hands. Their success must grow out of a general appreciation of the value of all scenes of natural beauty as a public possession. Is it too much to hope that the time will come when a wanton or needless destruction of the natural beauty of the world, which is our common heritage, will be treated as a gross offense against public decency, and when such an offense will be considered as truly a felony before the law as any other invasion of the natural rights of the people?

Llewellyn Park.

LEWELLYN PARK has an historical interest from the fact that it was the first attempt on a considerable scale to organize what has been called a "residence park"—that is, an area of ground which is treated as a unit from the landscape-gardener's point of view, and yet is divided up among various property-owners, each one of whom owns his plot, but under certain restrictions in regard to its relation to the whole. Llewellyn Park was admirably situated for an experiment of this sort, and it was conceived and planned by a man who had not only a passionate love for nature but also a genius for organization. This man was Mr. Llewellyn S. Haskell, who saw the possibilities offered by the south-eastern slope of the Orange Mountain, which is adjacent to the city of Orange, and from which the greater cities clustered around New York harbor can be seen, and almost heard, and yet contains passages of untamed beauty and sylvan picturesqueness which are most refreshing to city-wearied senses. Mr. Haskell began to secure land as long ago as 1853, and he soon had possession of six to seven hundred acres in one body, extending from the level at the base of the mountain to its summit. Some of the land was rugged, and some forest-clad, although the hard features of most of it had been softened by cultivation for many generations. The prospects toward the south and east are magnificent in their extent and variety, while the land itself was made unusually attractive by a sunny exposure, diversified surface and fertile soil.

This park was divided up, and sections of it sold to persons who wished to have homes amid country surroundings. The land was conveyed to each resident in fee-simple, but he was restrained from erecting factories or other structures offensive to his neighbors, and he was under obligations to contribute to the general maintenance of the park. Some ten miles of admirable roads, with bridges and other necessary constructions, were made. There are several entrances, the principal one being the subject of our illustration on page 583. The skill with which this has been designed and constructed is a fair sample of the quality of the work throughout the park. One of its most beautiful natural features is a ravine which traverses its entire width to the very summit of the mountain. Through this runs a happy little brook, and the land on both sides of it, amounting to some fifty acres altogether, is held as the common property of all the residents of the park, and is to be reserved for all time as a general pleasure-ground. To maintain this "Ramble," with the roads, road-borders, walls, bridges, etc., an annual tax of ten dollars is levied on each acre of land.

Mr. Haskell died before his plans were fully realized, and the park is not yet thoroughly occupied and improved. It is, however, a place of rare interest and beauty. It perhaps contains no primeval forest, but there were many stately trees here when Mr. Haskell obtained possession, trees more than a century old, and those which he planted have already attained sufficient size and age to give them dignity. In all parts of northern New Jersey the natural forest-growth is very rich in species, and examples of nearly all of the trees which are native in this vicinity are found within its boundaries. Oaks of several species, Chestnuts, Hickories, Maples, Tulip Poplars and Beeches, many of them trees of magnificent proportions, are especially abundant, and the extent of forest and thicket is still sufficient to invest the park with a woodland charm in spite of the many residences, more or less pretentious, within its borders. Indeed, the number of these buildings could perhaps be doubled without destroying its rural and sylvan beauty.

Llewellyn Park is old enough to have a history. Children who were born in it are now living there with families of their own, and there seems to have grown up such an attachment to the place among the residents as men only have for their homes. Their gratitude to Mr. Haskell

for his conception and its fulfillment has been expressed in the form of a bronze portrait-bust, erected in his honor near the entrance. It is easy to conceive that a community of persons who appreciate the advantages of such an arrangement and enter heartily into it might persistently adhere to its original purpose. If such a park was originally well planned, and if a competent superintendent, who sympathized with its aim, could be had to insure its maintenance, its beauty and usefulness would steadily grow as it matured toward the realization of its design, and it would be an ideal place of suburban residence. But as time passed new owners would have to be admitted to the circle—families with different tastes and preferences—so that at last it might be possible to have the park filled with people who cared only for that portion of the land which they owned, and took little interest and no pride in the scheme as a whole. Parks somewhat similar to this in character have been of late years established in various parts of the country, and it would be instructive to know something of the lines upon which they have developed and how nearly they are fulfilling the purposes of their founders. The problems in social science which are here presented are still more intricate than those in landscape-architecture, and we should be grateful to any reader who has had experience in the practical working of such organization for a statement of facts in the case.

Notes of a Summer Journey in Europe.—XIX.

A WEEK spent among the living collections at Kew, and devoted almost entirely to the woody plants outside, with scarcely a glance within the greenhouses, is hardly sufficient to gain an intimate knowledge of the rich stores in this botanical treasury; but with well-used time one may acquire some general idea of the place.

Kew is so often written about and described, and Mr. Watson and Mr. Nicholson have given us so many and such full accounts of current events there, that such matters call for no additional mention; but since it has just attained the jubilee, or semi-centennial, year of its efficient reorganization it is worth while, perhaps, to make a hasty sketch of its development.

The early history of Kew Gardens, a good résumé of which may be found in the *Kew Bulletin of Miscellaneous Information* for December, 1891, is interesting as showing how this, like so many other scientific and proven useful institutions, had to struggle through a long series of vicissitudes before its value was thoroughly appreciated by the public and it became properly established on a permanent basis. Until within about fifty years Kew may be considered to have been the private domain of the sovereign, although in the period immediately preceding its reorganization its strictly private character had been gradually diminishing, and it became more accessible to the public and more of a national charge. But even while it formed a part of the royal estates it was famous in the botanical world of the day, for it was under the superintendence of such men as the Aitons, and for a long time Sir Joseph Banks may be considered to have been the director in fact if not in name. The celebrated William Turner, who died in 1568, has left a record of having had a garden at Kew, but of this nothing is really known.

The beginning of a collection on the present famous site is said to have been made soon after the middle of the seventeenth century by Lord Capel, a brother of Lord Essex, who introduced a large number of kinds of trees and shrubs from France. Some of these were probably fruit-trees, and very likely some came from the famous "potager," or Royal Kitchen Garden, at Versailles, which was established at about the same time. In accounts published in the latter part of the seventeenth century we read of Capel's beautiful and well-kept orangery and myrtetum; his *Lentiscus*-trees, for which he paid £40; his trimly shaped white-striped *Hollies*, which cost him £5 each, and his flowery and showy *Laurestinuses* trimmed to equal regular size.

"About the year 1730, Frederick, Prince of Wales, obtained a long lease of Kew from the Capel family, soon after which he commenced a fresh arrangement of the pleasure-grounds, which were laid out, and additional plantations made, under the direction of the celebrated Kent, who was also engaged in the decoration of the house itself." This Prince of Wales died in 1751, and his wife, the Princess Augusta of Saxe Gotha, who died in 1772, is said to have given to Kew Gardens, during the

last years of her life, "the definitely scientific character which they have ever since retained." In 1761 a large hot-house, 110 feet long, was designed and erected by Sir Wm. Chambers, and it was at that time the largest in the country. It was taken down in 1861, or just one hundred years afterward.

After the death of the Princess Augusta Kew Palace and the grounds passed into the control of George III., who is credited with having strictly maintained the botanical character of the establishment which had been begun by his mother. About this time Sir Joseph Banks began to figure in affairs at Kew and his name to become familiar in botanical literature, and especially with regard to the introduction of many plants until then unknown to the science of botany or in cultivation. Largely owing to this gentleman's liberality with his time and money, the gardens soon took a leading place among all such institutions in Europe, and, although its standard appears to have varied in later years, Kew began to be looked upon as a Mecca by botanists and gardeners. The efficiency and eminence of such gardeners as the Aitons at Kew helped to make its treasures widely known and appreciated. William Aiton, in 1789, published his *Hortus Kewensis*, or catalogue of plants in the Royal Gardens at Kew, a work including some 5,500 species, a brief description of each, its native country, date of introduction and introducer being given.

In 1772 the first regular collector was sent out from Kew, the collector in question being Francis Masson, whose destination was the Cape of Good Hope, and who was instrumental in introducing hundreds of species, some of which were collected in other fields besides those of South Africa. From this time the treasures of numerous collectors found their way to Kew, and thence were distributed to other parts of the kingdom or to colonies abroad.

That portion of the grounds in which a collection of trees was established was at first quite small, only a few acres in extent, although some interesting trees were also planted outside of it. It is curious to note how some of these early-introduced plants were first treated, their character in regard to hardiness not being well understood. For instance, a fine specimen of the Japanese Ginkgo biloba was originally trained against a wall. One of the largest and best accessions to the collection of trees was obtained from the garden of the Duke of Argyle, at Whitton, in 1762 or 1763. These trees had been raised from seed many years before by the tree-loving Duke. They were transplanted to a part of the Kew grounds not now designated the Arboretum, but several of the specimens are still standing where they were placed 130 years ago.

The Arboretum proper, as it exists at present, includes about 178 acres, which, until within recent times, or, more precisely, until 1850, was simply a sort of pleasure-ground and game-preserve. Since that time it has been planted with trees and shrubs grouped with regard to botanical sequence according to modern classification. The comparatively small size of many of the exotic trees is likely to prove somewhat disappointing to those persons who have come to think of Kew Gardens, as a whole, as a very old institution. The fact is, that the territory has been acquired gradually. With new accessions of land and changes in the management, alterations and modifications of plans and planting have seemed necessary, in order to give the whole establishment a regularly arranged aspect instead of the heterogeneous aggregation which it otherwise would present for all time. As it is now probable that no material additions to the area will be made, or, at least, be absolutely necessary, the trees are likely to remain in their present positions and grow without further molestation.

Besides the 178 acres called the Arboretum, the Botanic Garden proper includes about seventy acres, so that the whole establishment at present comprises very nearly 250 acres, an area requiring a good deal of time to go over so as to thoroughly appreciate the collections planted upon it. The situation is not the most advantageous for the finest development of tree-growth, because the soil is mainly of a poor, sandy or gravelly character. But while there is a lack of natural fertility, a partial compensation may be found in an abundance of moisture, both in the general humidity of the atmosphere and the low-lying situation of a good portion of the ground, which is not very much above the high-water of the Thames, which bounds it on one side. Certain portions of the garden are said to have been formerly covered by ponds or lagoons, and the site of the large Palm-house was once covered by an extension of the same sheet of water which now lies in front of it.

Since its reorganization in 1841 Kew has successively been presided over by three directors: first, the late Sir W. J. Hooker, followed by Sir J. D. Hooker, and lastly, Mr. W. T. Thistleton Dyer, who has succeeded in the care within a few

years. The institution is supported by the Government by an annual appropriation, which nearly amounts to a hundred thousand dollars. After a certain number of years of faithful service the employees are entitled to retirement with a pension.

Kew has accomplished, and is accomplishing, four distinct and valuable objects. It is acknowledged by all the world as the headquarters of botanical science; it has been and is a centre of economic botany, by which the colonies in all parts of the globe have especially benefited; it is practically a great school of botany and horticulture, where instruction is given in all matters relating to plant-life, both on its useful and æsthetic side, and it is a place of rest and quiet to hundreds of thousands who visit it every year.

Arnold Arboretum.

J. G. Jack.

Botanical Notes from Texas.

WACO is in central Texas, just at the ninety-first meridian, and in latitude about 31° 20'. The city is in the valley of the Brazos River, which, though nearly a thousand miles long, is entirely within the limits of Texas. The city takes its name from the Waco Indians. Here their principal chief resided, and here their council-fires were lighted.

About three miles above the city, on the right bank of Bosque River, a little above its junction with the Brazos, there is a high bluff. A projecting point of the bluff is known locally as Lovers' Leap, in accordance with the same old legend which has done duty in connection with many other precipitous places throughout the country; a daughter of the Wacos and her chosen warrior ended their lives and loves when hotly pursued.

Waco is a city of about 20,000 inhabitants. It is chiefly remarkable for the number and character of its artesian wells. Within the city or near it there are twenty-one of these wells, having an average depth of a little more than 1,800 feet, and a flow of from 100,000 to 1,200,000 gallons of water in a day of twenty-four hours, with a pressure at the ground of fifty pounds. The water of these wells, as it flows from the ground, has an average temperature of about 103°.

There have been a few light frosts here, and Cotton-plants are killed; but the gardens are still adorned with the choicest of Roses and Chrysanthemums. Leaves of Elms and of Box Elder and Hackberry are falling, while those of deciduous Oaks and Cottonwood and other species are taking on their handsomest autumnal tints, and in striking contrast with the unscathed bright green leaves of the Live Oak. Dripping Springs is on the left bank of the Brazos, about four miles above the city. For a long distance water continually drips from the rocks of the bluff about as it drips from the eaves of a building during a heavy rainfall. The handsome *Adiantum Capillus-Veneris* is there, pendent in great profusion from the rocks amid the falling drops of water. This almost cosmopolitan Fern is very abundant throughout central Texas; it fringes most of the irrigating ditches at San Antonio, and large and beautiful individuals crowd each other upon the moist rocks along Colorado River at Austin.

Hackberry is the most common street and lawn tree of Waco. I have noticed that "northers" have a killing effect upon China trees, even in this latitude, as the dead tops of many of them show. The drupes of this species are poisonous, at least to birds. Robins often eat them until they become intoxicated and tumble from the trees.

Several species of Aster are yet in blossom, with an occasional *Helenium*, and rarely the handsome flowers of *Gilia coronopifolia* are to be seen. *Centaurea Americana* is so abundant in many localities in central Texas as to become a weed. It is often seen in gardens, where its beauty entitles it to be. It extends northward throughout the Indian Territory.

Several species of *Desmanthus* abound in this region, among them *D. leptolobus*. This species extends northward in Kansas to the Saline River, or to beyond the thirty-ninth parallel. In early spring hill-sides here are covered with such eastern species as *Erythronium albidum*, *Anemone decapetala* and others, which mingle their beauty with the western *Lupinus subcarnosus* and many more decidedly western species. Our little *Dichondea repens*, too, is here. *Heteranthera graminifolia* is common in running waters of central Texas. It is very abundant in Colorado River at Austin. I saw it also in Llano River near Llano. This rather pretty aquatic has a more western range than is usually allowed it. I have collected it near the one-hundredth meridian in Kansas, and it probably extends still farther westward in this state.

Waco is the most northern station at which I have seen *Capiscum baccatum*, "Chiltapin" of Mexicans, growing without cultivation. The intensely acrid berries of this species are exten-

sively used by Mexicans as a condiment. That fact might excite no surprise. But birds are fond of them. Even mocking-birds eat them with avidity, and without injury to their vocal organs. Wild turkeys, too, use them in the fall, until they are literally seasoned by them, affording us most excellent natural "Chile con carne."

Acacia Farnesiana is rarely seen here, though it is one of the commonest shrubs or trees of southern Texas. It extends into the other Gulf states and far southward. So far as the observation of the writer has extended, this species attains a larger size than any other Texas species of the genus. I saw a tree of this species felled last summer in Victoria that was about eighteen inches in diameter and thirty feet or more tall. It is a handsome sight in blossom, covered with thousands of little globes of small, very fragrant, yellow flowers. About the first of last January, at Goliad, I saw such a tree in full blossom. *Apostaxis* occurs largely in this species, as it does in most of its congeners, and also in Mesquit. These gums possess, probably, properties similar to those of gum Arabic, for which they may prove to be a valuable succedaneum.

Parkinsonia aculeata, "Ratama," or Jerusalem Thorn, is also here in gardens and as an escape. Its light graceful sprays and foliage and handsome yellow flowers, which are produced from May to November, make it a popular lawn tree throughout the south and as far north as it will thrive. *Diospyros Texana*, Black Persimmon, or "Chapate," grows on the bluff at Lovers' Leap. The species is very abundant from this meridian far westward. It may be seen, sometimes, not more than three or four feet tall, profusely covered with its small black fruit, and through all degrees of height, until it becomes a tree of middling size. The largest individuals that I have seen were on the bluffs of the Arroya near Beeville. Those were at least a foot in diameter and thirty-five feet tall. The fruit of this species is sweet and less astringent than that of its more northern congener, but it, pulp and all, is so intensely black, that in eating it the lips and fingers become of such a black-inky hue that it is not so generally eaten as the fruit of our other species, which also is found in this vicinity. The wood of *D. Texana* is very hard and close-grained and of economic value when such qualities are required of wood. Professor Sargent tells us that for engravers' blocks it is the best American substitute for box-wood. The bark of this tree exfoliates, and, when unleaved, the tree closely simulates in size, height and habit the cultivated Crape Myrtle (*Lagerstroemia*) when that plant is defoliated. The leaves of this species are small, oblong, thick, and with recurved margins. In the southern part of its range they persist until crowded off by the new growth.

Berberis trifoliolata, Currant, "Agrita," is one of the most interesting and important shrubs of western Texas. This Barberry is rarely found so far eastward, but I saw a few individuals on the bluffs of the Bosque. In southern Texas it blossoms as early as February and ripens its red fruit in May. The fruit, about as large as currants, has an agreeably acid flavor and is largely used for pies, jellies and preserves. The shrub may be easily recognized, even when destitute of flowers or fruit, by its glaucous evergreen leaves, which are variously cut and armed with spines. Its cultivation on an extended scale is desirable, as western Texas has no other early spring fruit which, green or ripe, will fill the place of this one.

Sophora secundiflora is rarely met with at Lovers' Leap, becoming very common farther westward. Usually a shrub, it occasionally becomes a respectable tree. Differing largely from our other native species, it produces large violet-colored flowers which are succeeded by large, often constricted, woody pods, each containing from one to half a dozen red, roundish, large seeds, which are said to be very poisonous. I have made no experiments to ascertain the truth of this charge. The seeds are easily polished, and are then quite handsome. Devout Mexicans use them in making the bead-rolls by which they tally their prayers. Growing with *S. secundiflora* sometimes, but oftener along streams in central Texas, is *S. tomentosa*. It is a small tree, with green bark, yellow flowers and small moniliform pods in lavish profusion. The seeds are blackish, small, and embedded in pulp. The eating of a portion of the pulpy fruit did not kill the writer.

Bumelia lycioides is abundant throughout this region. Its black oblong drupes are edible. The largest trees of this species that I have met were near Caldwell, Kansas. They were forty feet tall or more and a foot in diameter. The West Indian *Cassia occidentalis* is common in the streets of Waco. The odd *Eryngium Leavenworthii* is almost everywhere among limestone-rocks. This species is often mistaken by botanical tyros, sometimes for a Teasel, oftener for some *Cnicus*. Our species extends through the Indian Territory to Kaw River, in Kansas. When about to celebrate the nuptials of its flowers,

the whole plant shares in the festivities of the occasion, and, laying aside its plain green gown, attires itself in royal purple.

Cucumis anguria, which yields the gherkin of commerce, is often seen wild in this state. The fruit might be raised here without limit. The wild grapes would furnish the vinegar, Chiltapins the peppers, and Texas might supply the world with pickled gherkins.

Waco, Texas.

E. N. Plank.

New or Little-known Plants.

Prunus tomentosa.

THIS little Cherry has been introduced into cultivation at several widely separated stations in North America, and in the coldest region where it has yet been tried it appears to be quite hardy and vigorous. It has flowered and fruited for some years at the Arnold Arboretum; and on the grounds of the Iowa Agricultural College at Ames it is reported as withstanding perfectly the rigorous winters, its fruit-buds being hardy and its flowers enduring quite severe frosts without injury.

The species is a shrub and never attains anything like tree-form. Apparently mature plants at the Arnold Arboretum are only six or eight feet high, while it is described in accounts of it in its native habitat as from five to ten feet in height. It forms a broad, spreading, twiggy bush of numerous stems rising from the ground and clothed with branches to the base. These lower branches, where they touch moist ground, often send out roots and form independent plants. The bark is a gray or bronzy brown, at first comparatively smooth, but finally scaling off laterally in very thin flakes, like the bark of Yellow Birch.

The downy gray young branches are usually thickly covered with buds, from which a profusion of flowers and leaves appear simultaneously in early spring. In this latitude the blossoms begin to open soon after the middle of April, and they may be counted in best condition about the first week of May. They are smaller than the flowers of the common Cherry, white or light rose colored, usually assuming a distinctly rosy tinge before falling away. They are sessile, or almost so, and are crowded in clusters in the axils of the leaves. The leaves are mostly from one and a half to two inches long, rounded ovate in outline, acuminate, serrate, the serrations being tipped with a sharp point or mucro. They are sparingly hairy on the upper surface and densely and softly hairy beneath. The leaf-stalks are very short, and at the base of each is a pair of slender, lacinate, long, persistent stipules.

When ripe, the cherries average about half an inch in diameter, being round, or somewhat longer than broad. They are slightly covered with very short and inconspicuous hairs, and contain a medium-sized stone. They begin to ripen or change to a light red color in the latter part of June. Later the color becomes darker, and the cherries can hardly be considered to have attained their finest flavor and condition of ripeness until the second week of July. They have a pleasant slightly acid flavor; the flesh is firm and juicy, and without the noticeable staining properties characteristic of some wild cherries and plums. With careful selection and cultivation this little Cherry might prove of some economic value.

Prunus tomentosa is a native of northern China, and the same, or a closely allied, species is found in the high Himalayas of north-western India and in Thibet. It has been described by some botanists under the name of *P. trichocarpa*, or hairy-fruited Cherry, and plants labeled *P. mollis* have been received at the Arboretum.

The illustration on page 581 of a fruiting branch is of natural size, from a specimen grown in the Arboretum the past summer. The seed of this plant was collected in the mountains in the vicinity of Pekin, China, by Dr. E. Bretschneider, and was sown in March, 1884. It flowered and fruited in 1888, or earlier, and the bush now has apparently reached its fullest development, although it may attain a little larger size.

Arnold Arboretum.

J. G. Jack.



Fig. 99.—Prunus tomentosa.—See page 580.

Foreign Correspondence. London Letter.

A HANDBOOK OF IRIDEÆ.—This is the fourth of the valuable series of handbooks prepared by Mr. Baker, of Kew, and published in the last four years. No botanist of modern times has contributed more to what may be termed

garden botany than Mr. Baker, who has always shown a warm sympathy with and interest in horticulture, especially in its relations to systematic botany.

Since Herbert published his great work, *Amaryllidaceæ*, we have not had any book of more value to horticulturists than Mr. Baker's *Handbook of Amaryllidaceæ*, published in 1888. In the following year came a similar work devoted

to Bromeliaceæ, a most useful book to the few who are interested in these beautiful but hitherto neglected plants. Uniform with these two is the *Handbook of the Fern Allies*, as Lycopodiums, Selaginellas, Equisetums, and the like, and now we have this book, which is devoted to the Iris family. Mr. Baker says it is the last of the series, and that they are the outcome of special attention to their respective subjects since 1866, when he first joined the herbarium staff at Kew, of which he is now the head.

The sister order, Liliaceæ, he dealt with in an exhaustive series of papers published in the Journal of the Linnæan Society, but I feel certain that I speak for a large number of horticulturists in urging upon Mr. Baker the need of a similar work on Liliaceæ to those which he has now produced on Irids, Amaryllids and Bromeliads.

In the classification of the genera and species Mr. Baker has followed the *Genera Plantarum* of Bentham and Hooker with very slight exception.

Iris is limited to 161 species found in the North Temperate Zone, the South African *Moræas* being still retained as a distinct genus, although there does not appear any good reason for keeping them separate from Iris other than their geographical position. The great "Iris" from Lord Howe's Island, figured in GARDEN AND FOREST (vol. iv., p. 355), he places along with the *Moræas*. *Viesseuxia* and *Dietes* are also sunk under this genus.

There are no less than 133 species of Iris with rhizomatous stems, the remaining twenty-eight species being bulbous. Of the section *Oncocyclus* twelve species are described, most of which are in cultivation. The beautiful *I. Susiana*, *I. Gatesii*, *I. Sari* and *I. Iberica* belong to this section, all of them remarkable for the large size and great beauty of their flowers, and perhaps no less remarkable for their refractory behavior under cultivation.

MORÆA has fifty-four species. These lovely flowered, easily cultivated plants are not so much cultivated as they deserve to be. We have few more charming flowers than those of the plants hitherto known as *Viesseuxias*, and almost as much may be said of many of the *Moræas* proper. *M. Robinsoniana* is one of the handsomest plants in the whole order.

MARICA is a genus of stove-plants as easily grown as *Aspidistra* and nearly as useful for its foliage effect. At Kew we find the several species of the greatest service in the large houses, their evergreen, dark flag-like leaves always looking healthy, and their habit of producing suckers in abundance rendering them serviceable for planting in the beds or for borders. Mr. Baker describes eleven species, of which the best in cultivation at Kew are *M. cœrulea*, *M. Northiana* and *M. gracilis*.

TIGRIDIA is allowed eight species, of which the best is *T. Pavonia*, though some of those which are not known in gardens, for instance, *T. Dugesii* and *T. buccifera*, are likely garden plants, from the description of them. There does not appear to be any good reason for keeping up *T. Pringlei* as a species distinct from *T. Pavonia*.

Crocus had already a splendid illustrated monograph by Mr. G. Maw, F. R. S., but it is too expensive for the garden library. Mr. Baker divides the sixty-six species into three sections, which are again divided into spring and autumn flowering groups. Those who are only acquainted with the ordinary garden *Croci*, which flower in the spring, will be surprised to learn that of the true species no less than forty-two flower in the autumn, twenty-four only flowering in the early months of the year. *C. Susianus*, from the Crimea, is the "Cloth of Gold *Crocus*" of gardens; *C. Mæsiacus*, or *luteus*, is the well-known Dutch *Crocus*, and *C. biflorus*, the Scotch *Crocus*. *C. versicolor*, from the mountains of southern France, is the purplish feathered *Crocus* so common among spring bulbs, and *C. vernus* is the parent of the cultivated lilac and white varieties. Mr. Baker places *C. obovatus*, the Neapolitan *Crocus*, as a variety of *C. vernus*. I have before given a list in GARDEN AND FOREST of the best of the autumn-flowering species, but I would recommend Mr. Baker's book to any

cultivator who wishes to take in hand these beautiful and most useful species with a view to breeding from them a race of as great value in autumn as are the common spring-flowering kinds, a very possible and certainly most desirable object.

ROMULEA has thirty-three species, among them being some very pretty *Crocus*-like summer-flowering plants such as *R. bulbocodium*, *R. Clusiana* and *R. rosea*, grown in quantity by the Dutch bulb nurserymen. There are eighteen species of the Australian genus *Patersonia*, which is represented in a few gardens by *P. longiscapa* and *P. sericea*, plants worthy of a place in many gardens. The same remark applies to *Aristea*, of which there are twenty-seven species, including the pretty blue-flowered *A. corymbosa*, generally known in gardens under *Witsenia*.

THE *IXIAS* are allowed twenty-four species, but they cross so freely, even in a wild state, that it must be very difficult to draw the line between one species and another, as, indeed, is intimated by Mr. Baker. *Freesia* is limited to one species with two varieties, *alba* and *odorata*.

WATSONIA, a genus quite as worthy the attention of cultivators and breeders as its ally, the *Gladiolus*, is composed of fifteen species, nearly every one of which is cultivated at Kew. There are few more beautiful bulbous plants than *W. angusta* (in flower now), *W. Meriana* and its varieties, *W. coccinea*, *W. densiflora*, *W. rosea* and *W. marginata*. They are as easily cultivated as the common *Gladioli*, and they flower freely and continuously. There are twenty-seven species of *Babiana*, all African; seventeen species of *Acidanthera*, of which, so far as I know, the handsome *A. bicolor*, figured in GARDEN AND FOREST (vol. i., pp. 486, 487) is the only one in cultivation. They, too, are all African.

CROCOSMA AUREA is the accepted name for the plant known as *Tritonia aurea*, while of *Tritonia* proper there are thirty-one species, included in which is the plant known in gardens as *Montbretia Pottsii*, the parent with the *Crocus* of a race of most beautiful and easily grown hardy bulbs, which we owe chiefly to Monsieur Lemoine, of Nancy.

GLADIOLUS comprises no less than 132 species, fifteen of them natives of Europe and western Asia, all the others being African. Of the latter there are fifty-seven species with linear or rush-like foliage, and thirty-seven with ensiform leaves. Comparatively few of these have been introduced into gardens, although many of those not yet tried are evidently worth looking after, and they are generally natives of easily accessible places. Mr. Baker gives the following as the principal of those bred for garden-plants: *G. psittacinus* (*Natalensis*), *G. cardinalis*, *G. oppositiflorus*, *G. blandus*, *G. tristis*, *G. purpureo-auratus* and *G. Saundersii*. From these seven species have been obtained the four distinct races of *Gladioli*, the *Colevillei*, *Gandavensis*, *Lemoinei* and *Nanceianus* sections.

I have purposely gone into detail that the attention of readers interested, or wishing to be interested, in bulbous plants may obtain some idea of the interesting character of the Order *Irideæ* and of the way it has been dealt with by Mr. Baker. The whole of the work is in English; good plain English, I might say. The book is published by G. Bell & Son, London and New York.

ZONAL PELARGONIUMS.—American growers of so-called *Geraniums* may be interested by an account of the way these plants are treated by our best English growers who want them for winter effect. The *Geranium*, as this section of *Pelargonium* is popularly named, is emphatically everybody's plant. It will live and grow and flower under the most indifferent treatment, but, like all plants of this nature, it pays for good cultivation. There are not many growers in England who can produce such fine plants, large trusses and large well-colored flowers of *Geraniums* as Mr. Cannell, of Swanley. Mr. Pearson, of Chilwell, Nottingham, is, perhaps, as clever with them, and the Right Hon. Joseph Chamberlain is a very successful amateur-grower. Mr. Cannell has shown trusses almost as large as a child's head, composed of flowers nearly two inches in diameter. The Messrs. Pearson have long been specially interested in

Geraniums, both as breeders and growers, some of the best of the most popular kinds having originated in their Chiltern nurseries. Mr. C. Pearson was invited by the Royal Horticultural Society to lecture on the cultivation of Zonal Pelargoniums for winter, and the following is a résumé of what he said: People who object to the "glare" of the scarlet Geranium in summer delight in its warmth of color in December and January. The flowers are always useful, but specially so in winter, and they may be made to hold their petals a long time by dropping a little florists' gum in the eye of each flower. This gum is easily made by dissolving a little gum shellac in spirits of wine until the mixture is just thick enough to drop freely from a pointed stick. Dark crimson-flowered varieties, such as Henry Jacobi, are not the best colors for winter, as in sunless weather the flowers are often changed in color to a dull magenta. The best of the crimson-flowered kinds for winter is Charles Smith.

The following is my selection of the best sorts for winter-

and all flower-buds picked out as fast as they appear. The leaves should be thinned out severely. No stimulants, such as manure, should be given to these plants. In autumn the plants must be placed under cover, as they are easily spoiled by excessive wet. They should be allowed plenty of light and air, and, if necessary, more leaves be removed as well as the flower-buds.

A low span-roofed house, in which the stages are close to the glass and with a sunny aspect, is desirable for these plants during winter. The atmosphere in the house should be kept fairly dry by means of the pipes and ventilation. The temperature ought not to fall below fifty degrees in the coldest weather, and on mild nights it may be kept five degrees higher. During sunshine a temperature of sixty to sixty-five, or even seventy degrees, is not too high.

The plants should be watered in the morning. For the production of large trusses of flowers the point of the shoot must be stopped just above the bud. It is always best to stop the shoots after the flower-buds show.



Fig. 100.—Main Entrance to Llewellyn Park, West Orange, New Jersey.—See page 578.

flowering: White—Queen of Whites, White Lady, Sir Percivale. Blush White—Stella Massey. Pink—Constance, Lady Brook, Ethel Lewis, Amphion. Rose—Beauty of Kent, Rosy Morn, Rev. R. D. Harries, Radha. Salmon—Madame de Bourdeville, Ayesha, Lady Chesterfield, Mrs. Norman. Scarlet—Sunbeam, Swanley Gem, Corsair, J. L. Baldwin, S. Hibberd. Crimson—C. Smith, Nelly Thomas, T. Hayes. This selection may be useful as a guide to those who wish to grow a collection of the best sorts known in England.

The cuttings should be planted in August, and potted as soon as rooted into large thumb-pots, and again into four-inch pots. By the beginning of June they should be put into six or seven inch pots. The plants should then be placed outside in a sunny position, and, if possible, on a thick bed of ashes. All through the summer the plants should be carefully watered, the strong shoots checked by pinching,

The soil used is light loam, with a little cow-manure and sand. Leaf-mold is, Mr. Pearson believes, detrimental to good cultivation.

London.

W. Watson.

Cultural Department.

The Cherries of North-eastern Europe.

THERE is no more fascinating study to the lover of horticulture than that of the unfamiliar fruits of foreign countries which prove themselves to be particularly adapted to his own country. For upward of twenty years I have been engaged in this study, partly from necessity, because I am too far north and high up to grow the familiar varieties of my youth, but also because I find a real superiority, as well as a greater adaptability, in these novelties over the older sorts with which I had worked for years. While their work among the Apples of north-eastern Europe seems to me of far-reaching importance

to a broad region in northern America east of the Rocky Mountains, Messrs. Budd and Gibb, during their summer's tour in Russia some ten years since, did not neglect other tree-fruits, and a large variety of both Plums and Cherries were imported. Professor Budd's relations, then formed with careful and well-trained pomologists of that region, have resulted in a continuous influx of new varieties. In addition to these he has, by the aid of missionaries in northern China and Mongolia, secured many valuable varieties, and perhaps species, of the tree-fruits of that part of the world. Since then, through his kind aid, I have been enabled to grow and test on my own grounds a large variety of new tree-fruits, the study of which from year to year has occupied much of my time. I am convinced that these interesting researches, while perhaps not bringing quite so much of absolute and striking novelty before us as those of Professor Georgeson, in Japan, are yet of no less importance to the fruit-growers of our continent.

It may be well here to note that while Messrs. Budd and Gibb were for America the pioneer students among the orchards and gardens of eastern Europe, the fruits of that region were by no means unknown in other parts of Europe. The Russian Apples, Pears, Plums and Cherries are quite well known and distributed in north Germany and the Scandinavian countries. It was, indeed, by the way of Sweden, through England, that our earliest importation of Russian Apples took place some half-century ago. It is altogether probable that had not some enterprising fruit-growers of eastern Massachusetts imported that half-dozen varieties of Russian Apples we of the cold north might yet be left to our own extremely limited resources in the way of available tree-fruits.

As to Apples and Pears, I have endeavored to keep the readers of GARDEN AND FOREST informed of the progress which is being made in their study in northern New England. More recently I have been enabled to report something of parallel experiments with Plums and Cherries, and even in a slight degree with Apricots. Of this latter fruit, though the results with the Russian forms are not promising for northern New England, they have at least proved that there can be hardier races than those of western Europe; while later tests with sorts from Mongolia give strong hope that the area of their successful cultivation can be extended quite to the banks of the St. Lawrence River.

As already stated, north-western Europe is not unfamiliar with the native tree-fruits of Russia. Many of the Cherries recently imported into this country from Russia are grown now in Prussia, Poland and North Silesia. Yet their original home was, with slight doubt, eastern Europe and northern Asia. Some of these have even reached western Europe from Asia by the Cape of Good Hope, having been brought from Asiatic ports in Spanish and Portuguese ships. These varieties from both directions have met, and been found to be identical, in the gardens of Holland, for this is a small world after all. But the same or very similar varieties are reported as growing in a semi-wild state as escapes from gardens on all the bluff lands near the rivers of central Russia, while the most truly iron-clad, like the true Ostheim and the Besarabian, are strictly Russian. Other so-called Ostheims—no doubt seedlings grown from mixed seed in Germany, are not hardy, or at least not "iron-clad." And as to the now pretty well-known Griotte du Nord, it will be seen by a reference to the Pomological Manual of the late W. R. Prince, pp. 146, that "the Dutch obtained this variety from Russia." Indeed, as Professor Budd remarks, it is a variety of the Ratifa family, found growing with the Brusseler Braune, on most of the roadsides of southern Russia. These are not, like many of the Russian Cherries, a dwarf family; for Professor Budd says that on the road-sides and division lines of estates in Russia he has seen the trees much larger than he has ever seen Early Richmond, or any of the Montmorencys, in this country. In Iowa, and, so far as they have fruited, here in Vermont, they prove to be great and continuous bearers, even in the most unfavorable seasons. I have fine trees of these sorts, nearly twenty feet high, which have proved quite as hardy as our wild Bird Cherry (*Prunus Pennsylvanica*). They are chiefly valuable for culinary uses, canning, and the making of "Ratiña," or what is commonly known as "Cherry Bounce." Still, the slight bitter which characterizes this family of Cherries, even when fully ripe, is agreeable to many; and some regard them as excellent dessert fruit. Even when gathered prematurely, no trace of bitterness remains after cooking. Professor Budd expresses the belief that in time these iron-clad Ratifa Cherries will be planted along the roadsides in America, as they are in Europe.

Another variety, known as Lutovka, represents a family of large-growing road-side trees, found all over south Russia.

Where in the orchard such dwarfs as the little Spate Amarelle, Shadow Amarelle and Orloff, only six feet high, are seen in full fruit, Lutovka is at the same age a large round-topped tree. Its fruit exceeds the English Morello in size, is yellowish red in color, and would be called excellent for dessert use, even where the Heart Cherries can be grown. This family is so common in Russia that it is found as an escape from culture, yet it is only lately attracting the very favorable attention of growers in Poland, Bohemia and parts of north Germany.

The Asiatic Sweet Cherries, represented by Orel Sweet, are also strong growers, but not so upright as the Sweet Cherries of western Europe. A glance over the collection planted in 1883 in the grounds of the Iowa Agricultural College shows many varieties larger and stronger in growth than Richmond or Montmorency Ordinaire.

Of the dwarf sorts belonging strictly to Russia it is said that Orloff and Sklanka are proving continuous and heavy bearers. In my own grounds little trees three years set are bearing well, without regard for spring frosts in blooming time, and they mature their fruit as early as the Richmond. Sklanka is larger than Richmond, with a small pit, firm flesh, and is excellent for any use. Spate Amarelle, Shadow Amarelle, Large Long Late, Shubianka and Double Natle are continuous heavy bearers. Of some of these I have quite large trees, entirely unharmed by a cold that freezes mercury. There is no better fruit of this class for canning or preserving in sugar. They are incomparably better in quality for the table than any of the Morellos of western Europe; but as they are long in ripening, and double their size after beginning to color, their long exposure renders it necessary to protect the crop from birds by the use of netting. When fully black they are, to my taste, better than any of the Heart Cherries. Allow me to add that I am not propagating these fruits for sale.

Newport, Vt.

T. H. Hoskins.

Winter Protection.

IN almost every garden there is sure to accumulate a number of plants which one comes to consider indispensable, though not hardy enough to be left outdoors during the winter in severe climates. The cellars of dwelling-houses are not always available for storage, being either too hot or too cold, and the question naturally occurs, What are we to do with them? It is not advisable to place such plants in a heated structure, as they need rest, and should not start to grow until they can be safely planted outdoors in spring. The one place of all others for all half-tender border-plants is the cold-frame, but the term is perhaps an unhappy one, in that we do not build a frame and invite the cold to enter in because it is a cold frame; on the contrary, the frames are well protected in winter by a lining of dry leaves, packed tight outside and kept in place by boards, and the sashes are covered with mats, and shutters to keep the mats dry. In this way we manage to keep out the frost, and rarely do we get the plants frozen. Lily-of-the-Valley for forcing, Astilbe, pot Roses, Freesias, Ixias, Ranunculus, double Anemones, Anemone fulgens, Pansies, stock-plants of Chrysanthemums, Violets, Hollyhocks, Fox-gloves, Narcissi, Bulbocodiums, and, in fact, the whole of the winter-forcing bulbs may be safely stored in cold frames of this description. Chrysanthemums stored in this way produce excellent cuttings, stout and vigorous in May, just when they are wanted for growing on for pot-plants of medium size, or for large flowers. Freesias may be kept until March in this way, and will not have the weak habit of those brought on earlier in heat. All plants that have green tops must be exposed to the light on all favorable days and given air during sunshine, but bulbs and plants that have no top-growth may remain covered until required for use elsewhere.

There is a good deal of labor incidental to the management of cold frames in the covering up and uncovering daily, but this is offset by the little attention necessary in watering as in a greenhouse. Very little water is required in winter; the less the better, as long as the plants do not suffer, as one's greatest enemy is the tendency of such plants as Violets to damp-off; these must be carefully watched and decaying parts removed at once, or the plants will surely and rapidly die.

In the spring-time these frames can be utilized as hot-beds for the production of early vegetables, such as Cauliflower, Lettuce, Radishes, Beets and the raising of a host of tender seeds, such as Tomatoes, Celery, Zinnias, Asters, Stocks and many others. The use of the hot-bed was much better understood in the old days than it is now, but it is still the best of all ways to raise seeds and to grow on the young plants in a sturdy, vigorous way. We take out the soil to the required depth and place bricks under the corners of the frames to pre-

vent their settling down, and fill in with the fermenting material, covering this with soil about six inches deep. When the Lettuce-plants are set out Radishes are sown between the rows, and as the Lettuce is used from alternate rows, Cauliflowers are set in their places. Beets take long to mature, and are given a frame to themselves. In a word, there is no end to the ways in which cold frames can be utilized. We have sixty sashes, six by three feet each, all arranged on frames, three sashes on each. In this way they are easily moved from one place to another, and winter and summer these frames are always fully occupied. Mice are sometimes to be found with snug winter quarters in the bulb-frames, and a happy time they have until *Felis domesticus* comes on the scene. The moral is, examine the frames regularly, even if they are not opened daily.

South Lancaster, Mass.

E. O. Orpet.

Flowers in the Conservatory.

DECEMBER is a "between time" and usually the dullest month of the year in the conservatory. The *Chrysanthemum* is gone, and the usual array of Dutch bulbs, forced roots and shrubs are yet to come. *Freesia refracta alba*, with its graceful cymose-scapes of lovely, sweet-scented tubular flowers, is at this time very common. It is one of the most useful bulbs to grow for any purpose, and competes for popular appreciation with the better-known Roman Hyacinths and Narcissus. Cyclamens, which were formerly not considered in season until spring, may be had in bloom early by a little forcing. *Reinwardtia trigynia*, a bright yellow sub-shrub belonging to the Flax family, is quite ornamental at this season, yellow being rather an unusual winter color.

The indispensable Jerusalem Cherry (*Capsicum capsicatum*) is serviceable, as it bears a great deal of hard treatment. Species, varieties and hybrids of *Hippeastrums* are among the rarest and most beautiful of winter-flowering bulbs. Like most South American *Amaryllidaceæ*, they have a short season of growth and a long rest. One secret of success with these plants is, that they need quite a hot dry season of ripening to get them to bloom well. Dr. Masters is one of the earliest and best of the hybrids, many of which, unfortunately, are held at high prices. There are, however, a few of the types, notably *H. equestre*, *H. Johnsoni*, *H. psittacinum* and *H. vittata*, which are reasonably cheap and handsome enough for any one. *Hippeastrums* will bloom well for several seasons in one pot, provided a little fertilizer be given during their growing season.

The practice of growing *Mignonette* in pots for winter use is not carried to such perfection in this country as in England. Without the care necessary to grow specimens, a few plants in six-inch pots, carrying five to six spikes of flowers, will remain in bloom a long time, giving a continuous, delicate and agreeable odor. *Lachenalias* are coming along; why they are so seldom grown is a mystery, unless it be the exorbitant prices asked for some of the kinds, as *L. Nelsoni*. *Lachenalias* are very easy to grow, and multiply rapidly if given generous treatment. Last spring I bought three packets of seed at twenty-five cents each, and have now over three hundred seedlings, several of which, I noticed the other day, are showing flowering spikes; next year they will be flowering bulbs.

At Mr. H. H. Hunnewell's place I noticed a neat little *Polyantha Rose*, named *Mathilde Soupert*, nicely in bloom in a cold frame. During the winter, when cultivating cuttings of *Mignonette* and *White Pet*, varieties of this class, I was struck with their free-flowering qualities; small plants grew and bloomed on every inch of growth, and I have often thought since that they might be effectively used for the decoration of conservatories in winter.

Statice Halfordii is an uncommon tender Thrift, bearing large compound panicles of bright blue flowers, which last a long time in perfection. The young plants are specially beautiful, old plants, unfortunately, becoming unsightly through the loss of the lower leaves, a condition unavoidable in a sub-shrub.

The winter-blooming *Begonias* are universal favorites. *B. Bismarckii*, a garden hybrid of doubtful origin, but evidently related to *B. rubra*, is one of the very best. It is always in bloom, winter and summer, and bears a large truss of lovely pink flowers. *B. semperflorens rosea-gigantea* is another useful variety for any purpose. It produces handsome cymes of red-rose flowers, excellent for bouquets. *B. incarnata*, *B. Socratana*, *B. Verschaffeltii* and *B. Scharffiana* are among other useful kinds.

French Cannas have lately become popular for winter decoration. After a short season of rest they will start up again

and bloom and increase in size all through the winter. These notes presuppose the careful and appropriate use of Palms, Ferns and other good-foliaged plants.

Wellesley, Mass.

T. D. H.

Orchid Notes.

A LARGE plant of *Epidendrum cochleatum* in bloom is an interesting, and, in its own way, a beautiful, object. The oblong, compressed pseudo-bulbs are from four to five inches high, and they bear two oblong-lanceolate leaves of rich green color, and somewhat leathery texture at the apex. The leaves are from nine to twelve inches in length, and the erect terminal racemes a trifle shorter. Six or seven flowers are closely arranged at the top of each peduncle, and the drooping sepals and petals are linear-lanceolate and of a whitish or very pale green shade. The lip, however, is the most characteristic portion of the plant, being erect, an inch in diameter, shaped like a cockle-shell, and of a rich black-purple color, with a small area of green at base and apex. *E. cochleatum* is not at all common in cultivation, but it well deserves the attention of gardeners. It should be grown in an intermediate temperature, with the roots in rough peat, sphagnum. Plenty of water and drainage is needed during the growing season. The water should be almost totally withheld for at least two months after flowering, and then the plant may be repotted, if necessary, and again prompted to grow by the application of water. This plant is common in Central America and the West Indies, and it is also said to occur sparingly on the coast of Florida.

Epidendrum nocturnum, the night-scented *Epidendrum*, is a widely different plant, also in flower now. This species was one of the first epiphytal Orchids cultivated in Europe, having been introduced from Martinique in 1816. The much-compressed stems are from twelve to eighteen inches high, bearing several oblong leaves, from three to four inches in length, on the upper portion. It is rare that more than one flower appears at the apex of a single stem at the same time, but they are produced in rapid succession for months together. The sepals and petals are of a greenish or light bronzy yellow color, about two inches in length, sometimes longer, linear-lanceolate, with the edges recurved, so as to give them a cylindrical appearance. The lip is pure white, with a bright yellow surface at the base; three-lobed, the lateral lobes large and spreading, the central one narrow, long and pointed. The individual flowers are borne on long slender pedicels, and they last from three to four weeks on the plant. Their fragrance is strong and agreeable at night, but scarcely perceptible during the day. The plant should be grown in a basket or on a block, with a little rough peat-fibre about the roots. An intermediate house suits it best, and it likes plenty of light. Water should be given freely during the growing period, and a very small quantity will suffice when the plant is flowering or at rest.

Cambridge, Mass.

M. Barker.

Notes from the Harvard Botanic Garden.

ALPINIA NUTANS.—In the general appearance of its stems and foliage this plant resembles a tall-growing *Canna*. It is from ten to twelve feet high, quite rigid and erect. The oblong lanceolate leaves of deep green, with paler midrib, are about two feet in length and six inches wide, the long sheathing petioles circling the stem from the base of the blade. The tubular flowers, each of which measures two inches in length by one and a half inches in perpendicular diameter at the mouth, and one inch horizontally, are borne in large pendulous racemes eighteen inches long. There are in each raceme from thirty to forty such flowers, the outer parts of which are pure white, tipped with bright rose. The central portion or lip is quite large in comparison, and very beautiful. The sides at the base are incurved, covering the conspicuous column-like arrangement of reproductive organs, and the margin fringed in front. The ground-color is a rich orange-yellow, with a profusion of deep crimson markings in the centre. The flower-buds are extremely pretty even before they expand. They are of ovate, oblong form, the color being pure waxy white, tipped rose. *A. nutans* is an excellent plant for large conservatories and Palm-houses. The foliage is pleasing at all times, and the flowers appear at various seasons, the racemes retaining their attractiveness about two months. Small specimens of the plant have little or no decorative value, but it develops rapidly. Its growth should be hastened until it is of sufficient size to fill a large tub with roots, and then it may be expected to flower freely. Large specimens require repotting about once in three years, and for these a small quantity of lumpy charcoal should

be added to the compost. A large amount of water is required when the plant is growing freely. It is a native of China and the East Indies, having been introduced in 1792, and is easily propagated by dividing the roots.

COMBRETUM PURPUREUM.—Some of the Combretums are pretty generally cultivated in European gardens, and they are very ornamental plants for the warm end of any conservatory. Those in search of plants choice and rare will find much to please them in the best of the Combretums, and they cannot do better than give them a trial. *C. purpureum*, however, is rarely seen even in the horticultural establishments across the ocean, though it is a plant of decided merit. It is a native of Madagascar, said to be commonly cultivated as an ornamental vine in the Mauritius, and, although introduced from the British colony in 1818, it has never become popular. It is of shrubby character, the free-rambling branches being densely clad with opposite, elliptical or slightly obovate leaves of deep green color, and from five to six inches in length, the petioles short. The flowers are loosely arranged in terminal, tapering panicles from twelve to eighteen inches long, and as many across at the widest part. The spreading, five-parted bright crimson corolla is about half an inch in diameter, and the filaments, of similar color, are erect, three-fourths of an inch long, and disposed in brush-like clusters. Our plant bloomed quite freely during the summer months, and is now again on the eve of making another display of flowers but little inferior to the first. It is grown in a pot, the branches trained to wires stretched along the sunniest side of the Palm-house, where they are always fully exposed to light and sunshine. They require a free supply of water in summer, when a thorough drenching with liquid-manure about once a week will also be found beneficial; but the roots should be kept rather on the dry side at other seasons. Cuttings of firm young wood, inserted in sand and placed in a close propagating structure, root freely in summer, and established plants should be so pruned and trained in winter that all the following season's growth may have equal access of light.

Cambridge, Mass.

M. Barker.

Correspondence.

A Spurious *Elæagnus longipes*.

To the Editor of GARDEN AND FOREST :

Sir,—What was said in your issue of November 9th about *Elæagnus umbellata* clears up a mystery of my own garden. That fascinating description of *E. longipes* which appeared in GARDEN AND FOREST December 12, 1888, made me long to possess myself of a specimen. When I received my shrub from the dealer it seemed to answer the description fairly well, though not precisely. This year it fruited, but instead of the oblong juicy berries, "half an inch or more long," I got a crop of puckery little fruit no larger than choke-cherries, and much like them in shape. Neither did they ripen in July, but in late October.

In the light of your recent explanation all is plain. It is clear that the nurserymen have been sending out *E. umbellata* for *E. longipes*. As there are quite likely to be other disappointed ones besides Mrs. Dandridge and myself, I think it might be well if the editor would kindly point out in detail the differences between these two Japanese shrubs. Is *E. umbellata* really worth the ground it occupies?

Marblehead, Mass.

N. A. Lindsey.

[*Elæagnus longipes* was first described by Dr. Asa Gray in 1859 from the botanical collections brought home from Japan by the famous Wilkes Expedition. In cultivation at the Arnold Arboretum it is a perfectly hardy bushy shrub, and at six or eight feet in height it appears to be fully developed, although in Japan, where it is often cultivated for its fruit, it assumes the habit and attains the size of a small tree eighteen to twenty feet in height. The stems and branches are dark gray or dark reddish brown and minutely scaly or dotted, the ripe annual growths being lighter-colored. The leaves are green above, silvery beneath, and noticeably sprinkled with dark-colored dots, more numerous on some leaves than others. They are without teeth, and are variable in shape on different plants; sometimes quite long, and not more than a third as wide, most usually oval or oblong, blunt-pointed and two inches or less in length, or occasionally so broad as to appear almost circular. The flowers are generally pretty fully expanded by the middle of May, and are borne singly or several together in the axil of each lower leaf of

the new growth of the season. They are yellowish within, but silvery and roughly scurfy on the outside, and often dark-dotted like the under side of the leaves. At blossoming time the flower-stalks are hardly half an inch in length, but as the fruit develops the stalks lengthen, until at maturity, in early July, they may average about an inch in length, being a good deal thicker nearest the fruit than at the insertion on the branch. The bright red or orange-colored fruit is oval in shape, blunt or slightly flattened at the ends, the skin thin and covered thickly with minute silvery white dots. The juicy and luscious-looking fruit, though edible and palatable to some people, leaves a disagreeable taste in the mouth, a quality which has been found even more pronounced in fruit that has been cooked.

Under the name of *Elæagnus longipes* some American nurserymen have sold large numbers of an entirely different plant, a species of wide distribution in Japan and China and other parts of Asia, and apparently one of the hardiest and the most northerly in its natural habitat. This is known as *E. umbellata*, under which name it is properly distributed by some of our nurseries. This may be distinguished from *E. longipes* by its lighter-colored bark, silvery gray, instead of reddish brown, young branchlets, a larger proportion of the branchlets being inclined to become thorns—hence the name, "Silver Thorn," sometimes given. The leaves are of a lighter green color, narrower and more rarely marked by dark dots on the under side than those of *E. longipes*. The flowers are white on the inner, densely silvery scurfy on the outer side. They are fragrant, and are often produced in clusters like little umbels. The flower-stalks or pedicels are quite short, and when the fruit arrives at maturity the stalks do not average more than a quarter of an inch in length. The fruit itself is usually red or amber-colored, small, round or oval in shape, commonly about a quarter of an inch long, sometimes less, but on some plants as much as three-eighths of an inch in length. It is often much more thickly covered with silvery dots than the fruit of *E. longipes*, and when fully ripe it has, on some plants, at least, quite an agreeable flavor, which improves the longer it remains on the branches. Sometimes it has little flavor or juiciness, and all the fruit for a good while after it has changed color is rather disagreeable and puckery. On different plants it appears to be very variable in time of ripening, and it persists for a long time in a fresh condition. The plant is in good bloom at the Arnold Arboretum about the middle of June, and the fruit may begin to show ripening colors by the middle of August, some plants keeping their fruit until late in November.

This shrub is larger, more open and straggling and more thorny than *E. longipes*. *E. parvifolia* is another name under which *E. umbellata* is sometimes found. It appears to have been given to a form with the larger, earlier-ripening fruit, but the plant has been found so very variable in different regions that the name of *E. parvifolia* is now generally regarded as synonymous with *E. umbellata*. This species will bear clipping and form a good hedge. *E. longipes* is sometimes to be recognized under the names of *E. crispa*, *E. edulis* and *E. rotundifolia*, given at various times by gardeners. The points of chief difference to be noted in distinguishing these two species of *Elæagnus* are the generally dark aspect of the first, as a whole, the other being much lighter and more silvery; the dark twigs and buds of the first and the usually silvery twigs and buds of the latter; the marked difference in the time of flowering and ripening of fruit; the difference in size of the fruit and the remarkable difference in the length of the fruit-stalks.—Ed.]

Flowers at Wellesley.

To the Editor of GARDEN AND FOREST :

Sir,—There are just now many interesting things in the greenhouses of H. H. Hunnewell, Esq., besides forced bulbous plants, such as Roman Hyacinths and Narcissi, which are already in full bloom and fragrance. The *Cyclamens* are full

of large flowers in varied colors, and there are many specimens of the Lobster Cactus (*Epiphyllum truncatum*) completely draped in soft rose-purple. The free-flowering *Bouvardias* are grown in generous quantity, and there are few greenhouse plants of such easy culture so generally useful in winter. They are very graceful and effective when in full bloom, and the flowers last well when cut. Specimens of good size may be obtained in a few months by inserting the cuttings in sandy soil and placing them in a hot-bed in early spring. The plants should be grown on in pots, plunged out-of-doors in summer, and removed to their final quarters in September.

The Calla Lily (*Richardia Æthiopica*) spathes are numerous on vigorous plants, and the gardener, Mr. Harris, called my attention to a variety named *Grandiflora*, in which the fragrance of the flowers is particularly sweet and strong. The Little Gem variety is also grown, there being a number of plants in promising condition, though Mr. Harris is of opinion that it will in usefulness prove far inferior to the well-known type. A large standard bush of an *Abutilon*, with light yellow, bell-shaped flowers, is rich in the luxuriance of its foliage and in quantity of bloom.

Solanum capsicastrum is grown on account of its ornamental fruits, which are as large as the white fruits of the Snowberry (*Symphoricarpos racemosus*), globular in form, bright red and glossy. There are also some specimens of *Solanum ciliatum*, a spiny plant with large Oak-like leaves and bright red fruits about the size of walnuts. Both these plants are highly effective and very desirable for a cool greenhouse.

A large plant of *Pleroma macrantha* in a cool conservatory was a grand sight, with its rich purple blossoms, a short time ago, and a few flowers still remain. Were the plant in a somewhat warmer house it would bloom more or less freely all winter. *Anthurium Scherzerianum*'s twisted spathes of vivid crimson are very showy, and produced in fair quantity on a medium-sized plant. There are still a few of the beautiful pinkish bracts on *Bougainvillea glabra*, a summer-flowering climber of rare excellence, and the large scarlet bracts of *Euphorbia pulcherrima* make a bold mass of cheering color. *Bignonia venusta* is grown in a warm house, the old stems covering a large area of the roof, and the young branches, laden with opening flowers, hang down in streamers of orange and green.

The numerous and healthful foliage-plants are being slowly crowded out by the introductions of Orchids. Mr. Hunnewell's collection of the latter plants gives every indication of speedily becoming one of the most important in this country, and they are in most competent hands, judging from the superb growth they have made during the past season. The *Phalænopsis* are now showing some extra strong scapes, and the plants of this group are in a condition rarely equaled. The following, among the plants in flower, are especially noticeable as showing the highest state of cultural development: *Cataseum saccatum*, *Cattleya bicolor*, *C. Gigas*, *C. Harrisii*, *C. maxima*, *Cypripedium callosum*, *C. Dominicanum*, *C. Spicerianum* (several plants of this species bearing two or three flowers to a scape), *Dendrobium Dearei*, *D. formosum*, *D. Phalænopsis*, *Lælia pumila* and its variety *præstans*, *Odontoglossum Harryanum*, *O. grande*, *Vanda Kimballiana* and *Zygotepetalum Mackayi*.

Boston, Mass.

Casual.

The Use of Cultural Directions.

To the Editor of GARDEN AND FOREST:

Sir,—The desire expressed by a correspondent for information which is adapted particularly to American gardens is a very natural one, and is probably the outcome of the idea that foreign practice differs in a great degree from our own, as it often does, just as garden practice in California must often differ from that of Massachusetts. One who undertook to give advice from the American standpoint would be confronted at once with conditions as diverse as can be imagined, since the United States offers about every known variety of climate, exposure and soil. Latitude furnishes few indications, as isothermal lines do not follow geographical abstractions. And temperature is only one factor in cultivation. What is the average moisture? Is it well distributed, or does it occur all in a given season? Then follow questions of fertility and the mechanical constitution of soils at different seasons, and many other problems of equal moment. In fact, any one who attempts to cultivate the smallest portion of the earth's surface soon discovers many things not mentioned in any cultural manual, and he finds that his operations must in many cases be tentative. Cultural notes are often very useful, but at best are mere relations of personal experience, and whether

they are made in England or New Jersey they must be modified as the intelligence of the cultivator decides.

The cultivator of the hardy garden, to consider a definite style of garden, is ever at the mercy of the elements, and the interest in the hardy plants is heightened by the never-ending struggle with nature. The popular idea of a hardy garden is that it is one where everything once planted goes on vigorously from year to year and from strength to strength with little or no attention. This is quite true of some strong-growing things, as *Phloxes*, *Pæonies*, *Funkias*, a few *Sunflowers*, etc., but usually, even with these, when unattended to, there comes a time when nature has her revenges. But these plants are of moderate interest beside the numerous hardy species which will naturally be sought for in a good hardy garden, and be a source of more or less perplexed pleasure to the grower. In late winter and early spring, if one watches the fields, he will discover that nature is apparently engaged with frost and sun-warmth in destroying all traces of vegetation. With a heave here and a heave there the mighty but quiet frost lifts out of the soil every root not safely anchored. It is only the great abundance of plants and seed which prevents the entire extermination of many species. If this is true among native plants, how much greater would be the destruction of exotic plants, which are at a further disadvantage by their small numbers in comparison with the native kinds?

The winter care of a hardy garden may seem the further end of its culture, but it is really one of the things to be considered in first planting. The careful, observing gardener will notice that even a very small garden has considerable diversity, if not of soil, at least, of warmth and natural drainage, and will always have it mapped in his mind with situations which seem suitable for plants of different constitutions. By observing the disappearance of snows from the garden one can gain a very good idea as to where it may be best to place certain classes of plants. Where the snow lies longest is, of course, the place to plant such things as are apt to start too early in the year, or are easily, from their nature, thrown out of the ground by frequent freezings and thawings. Where the snow disappears promptly rapid changes are apt to be the order of the season, and no exposed crowns or perennial leaves are safe, though if sheltered well from the north such a place may make a good early garden for bulbous plants. It is attention to seemingly small details and careful observation which makes the garden a success and a pleasure. How to make plants grow is knowledge not given to man, but if we will plant them carefully, attend to their wants faithfully and intelligently they will often grow for us.

Elizabeth, N. J.

G.

Horticultural Education.

To the Editor of GARDEN AND FOREST:

Sir,—Your editorial expression upon horticultural education is encouraging. I am glad that you appreciate the fact that a farmer's boy or girl may be greatly benefited by even a short one-term course of lectures, reading or practice. Our own institution, in common with others, now offers such a short course, and we have for some time considered the feasibility of instruction by correspondence, a plan which seems to me to be capable of good results. As you say, these courses cannot make finished gardeners, and, for myself, I do not look upon the mere information or instruction which the courses give as their chief value. The important result is inspiration. Kindle the spirit of enthusiasm in a youth; let him know what to look for; show him that all the simple amenities and ambitions of life are possible on the farm. When he once grasps this broader horizon of life, the farm is a new sphere, and citizenship has new hopes and responsibilities. Our people must be citizens as well as good farmers and good mechanics. I imagine that all the agricultural colleges which give short or special courses find that these are feeders for the long or general course. Our senior class is usually as large as the freshman class; sometimes larger. This shows that there is a contagion about education which it is difficult to resist. We all want to extend the college, university, experiment station; in short, the education spirit. Then we want all those who desire to take definite and prolonged instruction. We cannot yet hope to make every farmer a college graduate, but we hope that every one in the land shall feel something of the inspiration which comes from the newer and broader life.

Cornell University.

L. H. Bailey.

Notes.

Mr. W. J. Gordon, who died a fortnight ago in Cleveland, provided in his will that his extensive and beautiful pleasure-

ground, known as Gordon Park, should be given to the city of Cleveland under certain conditions. Mr. Gordon was a great lover of plants and flowers, and during his life his pleasure-grounds were freely open to the public on stated days.

For the purpose of awakening and increasing the interest in aquatic plants, and in Water Lilies particularly, Mr. W. W. Lee, of Northampton, Massachusetts, offers to send to any subscriber of GARDEN AND FOREST, photographs of *Nymphaea dentata*, *N. gigantea* and *Victoria Regia* Randi, all natural size, at cost and expense of sending, and also a large photograph of a pond containing a *Victoria Regia* and many tender aquatic plants in flower.

A writer in the *Gardeners' Magazine* describes an old tree of the Gloire de Dijon Rose in the garden at Blake House, near Taunton, England, which was budded on a brier-stock thirty-two years ago. The stem at eighteen inches from the ground is ten inches in circumference, and it is of standard form, five feet six inches high. The branches have a circumference of twenty-four feet, and the vigorous plant still blooms abundantly until late in the autumn, and shows no evidence of exhaustion.

At the Chrysanthemum Show in San Francisco last month, one of the features was a "petal-guessing contest," for which a premium of \$50.00 was offered by the Sherwood Hall Nursery Company. A large bloom of the variety known as "Prince" was set up on a black mounting so that its outlines could be distinctly seen, and visitors crowded around to try for the prize. More than 6,000 votes were cast, and the bloom was estimated to contain all the way from 120 to 10,000 florets. The actual number was 512.

Rev. Edward Everett Hale thinks that much of the eager talk in English prose and poetry about the beauty of hedge-row flowers is due to the fact that the rows are so high that one who walks or even rides between them in a carriage can see nothing else. In a guide-book made for pedestrians, travelers are especially directed in one place to look out for a gate, through which they can catch a glorious view of the sea, which, for two miles or more on either side, is screened from view by the high hedge.

M. H. Correvon, Director of the "Jardin Alpin d'Acclimatation, Geneva, writes to the *Gardeners' Chronicle* that he has received from the mountainous regions of Servia and Montenegro several interesting plants which have not been introduced into cultivation. One of them is *Chrysanthemum cinerariæfolium*, which has large and beautiful flowers and long-stalked leaves, double-lobed. Another is *Alyssum repens*, from Mount Durmitor, where it was collected at an elevation of 6,000 feet. It is a dwarf-spreading species, with yellow flowers, which surpass in beauty those of most other *Alyssums*. From the southern Caucasus, at an altitude of 2,000 feet, comes a beautiful Foxglove, *Digitalis ciliata*, which resembles *D. grandiflora* somewhat, and is an erect, graceful plant, which flowers freely from June to September.

It is said that the portions of Russia which are now stricken with famine are in the region of the black soil, which has always been considered one of the most productive portions of Europe. If this is true, the evil is, without doubt, largely the result of the same wasteful cultivation which has been going on in some of our own prairie soils. But, perhaps, the deforesting of the country is responsible for some of the difficulty. The destruction of the forests is spoken of with great positiveness as the cause of the famine by many observers, and although it is the fashion to exaggerate the influence of forests on climate, or, at least, to speak of their influence without knowledge, nevertheless it is quite probable that the forest which once protected the fields from hot winds in summer, and from equally destructive winds in winter, may have done much to mitigate what would otherwise be a rigorous climate.

Dr. Hoskins sends us a photograph of a Willow-tree which stands in Waterbury Centre, Vermont, near the base of Mount Hunger, with a trunk measuring twenty-four and a half feet in circumference and a symmetrical top which shades an eighth of an acre of ground. One who knows the early history of the Willow testifies that in 1840 it was a tree something like six inches in diameter, which had grown from a walking-stick driven into the ground a few years before by some children. In that year it was cut down deep into the ground in the hope of killing it, but it started a new growth, and has reached its present dimensions in fifty years. The rapid growth of the Willow in favorable localities is well known, and Dr. Hoskins writes of another near his home which sprang from a cane carried by a returning soldier in 1866, and thrust into the soil in his doorway. It is now more than four feet in diameter, with an im-

mense top, and bids fair, at an equal age, to reach the dimensions of the one before spoken of.

The unpacking, sorting, repacking and forwarding to all parts of the world of dried figs occupies more than half of the laboring population of Smyrna during five or six months of the year. Consequently the arrival of the first consignment of the fruit from the orchards is a great popular event, called "The Feast of the Figs." This year the harvest was magnificent, and a very joyous manifestation took place at the railway-station when the first train arrived, with its cars wreathed with garlands and its locomotive covered with flags. The barrels were quickly unloaded and placed on camels decorated with ribbons and flowers, and the procession started for the emporium, followed by a great crowd dancing to the sounds of music, and the evening was given up to concerts, balls and rejoicings.

The second part of Mr. Romeyn B. Hough's novel publication, *American Woods*, is quite as valuable as Part I., and we are glad to know that Parts III. and IV., each containing sections of twenty-five species, will be issued before the close of the year. These wood-sections are beautifully mounted, and they display the soft tints and delicate lines of the grain in a very interesting way. The slices are so thin that the light passing through them reveals many points in the structure of the wood which would otherwise escape notice, and as they are cut in three directions, across the grain and with it, and show both the heart-wood and sap-wood, they are very complete and instructive. With the specimens comes a pamphlet of text containing much accurate botanical and general information in reference to the trees. The collection ought to be in every public school and library in the country, and it would be an ornament to any parlor-table. Specimens of the woods are also mounted for use in stereopticons in slides of standard size, which show a circular field two and three-quarters inches in diameter. Mr. Hough's address is Lowville, New York.

Mr. L. Eugene Mouline, of the Department of Ardèche, in France, has invented a plan for drying potatoes. They are first crushed, after which the water is squeezed out. The compressed pulp is then separated into pieces and put into an oven, moderately warmed, where it remains until it is thoroughly dry and has taken on a light yellow tint. The temperature is high enough to impart an agreeable flavor to the product, but not high enough to completely transform the starch into dextrine. This new article of commerce, which can be kept an indefinite length of time, has been called torrefied potato-pulp. It can be used in a raw state for fattening domestic animals, and can be converted into a purée for human food by boiling water. It is also ground and made into a light yellow flour, which is mixed with wheat or rye flour and baked into a bread, which is very digestible on account of the partial conversion of the starch into dextrine. According to *La Nature*, the inventor hopes that this flour will be found advantageous from an economic point of view, and that its introduction will cause an increase in the cultivation of potatoes, which will be sufficient during years of drought to make up for a deficiency in the crops of cereals.

An act was passed at the last session of the Ontario Legislature which forbids the spraying or sprinkling of fruit-trees while they are in bloom with any mixture containing Paris green or other substances poisonous or injurious to bees. This legislation is based on the belief that bees are important factors in the production of fruit by helping on the process of fertilization, and that spraying the fruit-trees while they are in blossom will work injury to the fruit-growers as well as the bee-keepers, since it has been observed that since the introduction of the practice of spraying during the time that orchards are in bloom large quantities of bees have perished, presumably of poison. It is held, too, by some men, that honey produced from blossoms which have been sprayed with insecticides is a dangerous article of food. It is also argued that it is a waste of material and labor as well as of fruit to spray the trees while they are in blossom, since the plum curculio is not likely to be present to any extent until the fruit is set and the codling moth also deposits its eggs in the blossom end of the young apple just after the fruit is set. That portion of the pistil upon which the pollen falls is exceedingly tender and sensitive, and it is held by some authorities that the application of such substances as Paris green injures it to so great an extent that the process of fertilization is affected and the development of the fruit checked. A bulletin just issued by Professor Pantou, of the Ontario Agricultural College, upholds the law as in accordance with the teaching of science, and hopes that efforts will be made to have it thoroughly enforced.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLES:—Tree Butchers	589
Forest-legislation	589
Mushrooms	590
New England Parks—The Projected Park System of Providence, Rhode Island	Mrs. J. H. Robbins. 590
The Weeping Spruce. (With figure.)	Thomas H. Douglas. 591
North Carolina Notes	Professor W. F. Massey. 592
NEW OR LITTLE-KNOWN PLANTS:—A Double Morning Glory. (With figure.)	592
CULTURAL DEPARTMENT:—How to Grow Cyclamens	Kenneth Finlayson. 594
Diseases of the Carnation	Professor Byron D. Halsted. 594
Late Chrysanthemums	T. D. H., W. K. Harris, Edwin Lonsdale. 595
Orchid Notes	M. Barker. 596
House-plants for Shady Windows	W. H. Taplin. 596
Notes from the Harvard Botanic Gardens	M. Barker. 597
CORRESPONDENCE:—Fructification of the Grape	Alex. W. Pearson. 597
Roses in California Without Irrigation	H. G. Pratt. 598
New Cypripediums	Jos. Manda, Jr. 598
Plant Labels	Max Leichlin. 598
The River Garden at Coblenz	Charles C. Binney. 598
RECENT PUBLICATIONS	599
PERIODICAL LITERATURE	599
NOTES	600
ILLUSTRATIONS:—A Double Morning Glory, <i>Ipomœa purpurea</i> , Fig. 101	593
Branchlets of the Weeping Spruce (<i>Picea Breweriana</i>), Fig. 102	595

Tree Butchers.

IN one of the cities of New Jersey we saw last week a row of Norway Maples where the professional tree pruner had been at work. These trees had been planted more than twenty years, and had made a good even growth, branching some eight feet above the walk from straight trunks which are now about a foot in diameter. All the large limbs had been sawed off a few feet from the trunk, and from the remnants of these limbs an occasional stub was left projecting, so that practically nothing remained of what once was a tree but a mutilated stump. All the trees were literally ruined, and ruined, too, by those who meant to do a friendly act—ruined, through ignorance, by the very process which was intended to prolong their lives and add to their beauty and usefulness.

The men before whose grounds street-trees are planted usually know nothing about them, and cannot even call them by name, so that when a pair of these professional trimmers, with their equipment of ladders, saws and axes, appear, the proprietor is likely to be impressed with the superior knowledge of these supposed experts, and when they assert that the trees are all growing out of shape, or that their vigor needs to be re-enforced by some pruning, he surrenders at once, and the amputation begins. What will happen next year is that the tree, in its effort to make good its loss of vital organs, will send out from adventitious buds a profuse growth of slender twigs, and these will carry an abundance of leaves, so that the stump will uphold a globular mass of foliage. These leaves will help to prolong the life of the tree by digesting the food taken up by the roots, and although they will appear rank and vigorous, they are premonitions of death rather than promises of new life. Fungi will attack the raw wounds at the extremities of the amputated limbs, and they

will begin to rot. The decay will soon eat its way down to the base of the branches, and these will fall. The trunk itself will then be attacked, and the disfigured tree is doomed to certain and early death.

Now, street-trees sometimes need pruning. If, however, they have been originally well selected, a small knife will be all that is necessary, for a few years, to remove an occasional branch that starts out in the wrong place. There is rarely any necessity of cutting off a large limb. If this necessity ever does come, the limb should be cut off close to the trunk and the place smoothed over and painted, so that the wound will be ultimately covered with healthy bark. We have often explained that wherever a stub is left this must inevitably die, and as the trunk grows about it there will be a plug of rotted wood where the branch originally grew, and the disease will eat inward and downward as the water soaks in from without. After street-trees have attained mature size, pruning is rarely needed beyond the occasional cutting away of a dead branch or the removal of one which interferes with another.

In most cities property-owners are not permitted to cut down a tree along the street front of their own grounds without the permission of the city authorities. In many of these same cities, however, every owner has a right to prune his trees, and when such an owner listens to the persuasions of the professional trimmer, his trees, which have been fortunate enough to survive the attacks of the various corporations which operate wires and chop off branches which seem to be in their way, are menaced with a still greater danger. The truth is that the street-trees of every city and town should be in charge of some officer who is acquainted with their requirements. The superintendence should begin before the trees are planted. The officer should see that no species are planted which are not suitable for street-trees, and that only well-grown and healthy individuals of these species are selected. They should then be planted at proper distances and with all due care. They should have constant supervision and protection not only against the attacks of insects and disease and injuries inflicted through wantonness or carelessness, but against the wounds of ignorant pruners. Better have no street-trees whatever than trees which have been abused until they are objects of pity.

It lacks some months yet of being two years since the act was passed which conferred upon the President the authority to proclaim reservations of forest-lands. Six reservations have already been made, and, altogether, 4,500,000 acres of timber-land have thus been set apart, while twenty-six other locations are under examination by the General Land Office for the same purpose. This withdrawing of forest-land from sale is the first essential step toward any successful policy for preserving the public timber-lands, but, as we are just reminded by a circular of the American Forestry Association, the true policy is not one of total exclusion from forest-land, but rather of opening such land for rational use; that is, forest-lands must not only be protected from fire and plunder, but provision must be made for cutting the timber under proper supervision and precaution, so that the forests will serve their highest purpose in the present without any injury to their future. The eleventh annual meeting of the American Forestry Association will be held at Washington on the 20th of the present month, and the aim will be to prepare for some efficient administration of the public timber-lands which have been or are to be reserved. The bill of Senator Pad-dock, which is now on the calendar of the Senate, contains many good provisions, and is an improvement on all former bills which have looked toward a comprehensive administration of our forest-domain. The present meeting will be largely devoted to a consideration of this bill, with efforts to secure the passage of such of its provisions as seem to be of immediate necessity. Nothing but good can come from a full and public discussion of the merits of the measure now before the Senate, and it is to be hoped

that the meeting will be fully attended by representative men who are interested in the establishment of a wise national forest-policy.

In no part of the world are so many Mushrooms raised for the market as in the vicinity of Paris, where they are cultivated in the long subterranean quarries which produce the stone of which the better houses in Paris are built, and probably nowhere else is so much skill and intelligence shown in the management of the Mushroom-beds. Occasionally the plants are attacked with parasitic diseases, and the Mushroom-growers are quick in recognizing the first appearance of several different maladies. Professor Costantin, of the Ecole Normale Supérieure, has recently made a scientific study of Mushroom-diseases, and has been able to detect the causes of several of them.

The two principal diseases are popularly known as the molle and the goutte. In the molle, or mole as the name is now more frequently spelled, the growing Mushrooms are much distorted, at times so much so that the gills and top of the mushroom can no longer be recognized, and it looks more like a small round puff-ball. The molle is due to the growth of parasitic fungi known to botanists as *Mycogone* and *Verticillium*, forms which are stages of development of species belonging to the genus *Hypomyces*. The goutte, a disease which, apparently, does less harm than the molle, is recognized by the appearance of drops from the size of a pin-head to that of a pea, followed by discolorations on the surface of the mushroom. Professor Costantin believes that the goutte is caused by the growth of bacteria.

Professor Costantin has also studied the diseased conditions of the spawn, what is called by the French *le blanc*, used in starting the Mushroom-beds. What is called the *vert-de-gris*, from its color, is due to the growth of a new species of fungus, *Myceliophthora lutea*. The *plâtre*, which makes the beds look as if they had been powdered with plaster, is due also to a new species, *Verticilliosis infestans*. Besides the *chanci*, recognized by the rancid odor, which causes trouble in winter, there is a small gnat which is very destructive to the Mushroom-crop in some of the quarries.

New England Parks.

THE PROJECTED PARK SYSTEM OF PROVIDENCE, RHODE ISLAND.

THE beautiful city of Providence has awakened to a sense of the importance of preserving some of the picturesque forest-land lying at her gates, before it is too late to acquire it at reasonable rates. Certain public-spirited gentlemen, recognizing the great advantages of the situation, have combined to urge upon the city government the purchase of some fine points along the Blackstone River and the bay, and have in energetic publications set forth the wisdom of adding to the land already acquired, other well-wooded and historical regions, so that in time a connected system of parks and parkways may wholly encircle the town, and render it a more attractive dwelling-place than ever.

For such a system the city is exceptionally endowed by its surroundings of hills and water. At its southern end it touches upon Narragansett Bay; the broad Seekonk flows along its eastern border; on the north-west and north are chains of lakes connected by streams; on the south and south-west large ponds lie close to Roger Williams Park. There are, besides, numerous little rivers which flow from the neighboring hills in the upper part of the town, and the broad estuary, known as the Providence River, which makes up into the heart of the city, where it is crossed by bridges. The residences of the richer portion of the population are situated upon the brow and slopes of a steep hill, from which an extensive prospect is commanded, while the business portions lie below, along and across the river, with a broad plain, in which to expand, stretching away to the south and west. Here in the business centre is a tidal basin, known as the Cove, which is being filled up at great expense, some authorities think to the detriment of the river, which needs just this basin to catch the deposit of the tides, and prevent the shallowing of the channel. A great and wise effort was made to turn this reclaimed land

into a pleasure-ground by retaining a part of the tide-flow by means of gates, and surrounding these lakes with trees and greensward, in which case it would have afforded an attractive breathing-place in the very heart of the city. But the property has largely passed into the hands of the railroad company, and will probably ultimately be devoted to screaming and smoky engines and to rattling cars. Fortunately, the opportunities of the outskirts are sufficient to still afford spacious grounds in all directions, to which communication by land and water will be easy, if the projected park system is carried out, as it bids fair to be.

At present the only large cultivated park that Providence possesses is the tract which will soon amount to about 400 acres, known as Roger Williams Park; 104 acres of this land were bequeathed to the city in 1871 by the will of Betsey Williams; it is diversified with hills and dales, trees, lawn and water. There are fine woods of Oak and Pine, a large artificial lake of thirteen acres, adapted for boating in summer and thronged with skaters in winter, and near at hand is a large sheet of water known as Cunliff Pond, which will form a most beautiful addition to the grounds when the necessary arrangements for incorporating it into the present area are completed. The house, 123 years old, formerly inhabited by the testator, is still preserved in the grounds—a quaint old-time cottage furnished in antique fashion, and now used as a retiring-room for mothers with children.

Near the entrance is the statue of Roger Williams, by the Rhode Island sculptor, Simmons, representing that worthy high in air, with the muse of history writing his name upon a tablet at the base of the pedestal. Other sculptures ornament the park, among them a bust of King Ferdinand of Naples, the last Bourbon king, which was brought home from Naples, after Bomba's flight, by an enterprising citizen, who purchased it when it was rescued from the enraged populace, and buried to prevent its destruction. After serving as a rather incongruous ornament of the front yard of the proprietor for some years, it was transferred to these leafy shades, where it must afford much satisfaction to the Neapolitan organ-grinders when they take their recreation in the park. There is near the entrance a building where wild animals are accommodated, and hard by the playful buffalo disports himself with deer in a private yard of his own, his attentions having proved too much for his former companion, a goat, whom he once lifted over the fence in his high spirits, and put an end to him forever. The deer, being more nimble, are able to elude him when he attempts the same pleasantries with them, and the noble antlers of one of the stags looked as if two might play at the game of hooking, should the buffalo be again inclined that way.

A prettier sight than this park in the winter-time when snow is on the ground it would be hard to find. A broad road, some three miles in extent leads to it, which is thronged with the fine equipages for which Providence is famous. The sleighs jingling with bells drive with speed over the course, and then circle about the pond, while their occupants amuse themselves from amid their furs by a sight of the gay figures of the skaters, who come and go among the trees which branch over them, and follow in their flight the graceful windings of the icy course over which they skim. It is like a miniature Bois de Boulogne, with all this luxury and joyous sport, this kaleidoscope of moving figures, the trees bordering the drive-way, the foot-passengers gathering in groups to watch the flying skaters, and here one best recognizes the wealth for which this growing city is famous, and the general well-to-do condition of its inhabitants.

In addition to this park, which is greatly prized by the citizens and which the proposed additions will render a really important pleasure-ground, the city has recently acquired the Thomas Davis estate, a tract of thirty-five acres, lying within its limits, about a mile from the city hall. This charming spot, happily diversified with woods, meadow, upland, hill-side and ravine, and easily accessible by horse-cars, is a most desirable possession for any town. A forest of a century's growth ornaments the steep hill-side and ravine, through which a running brook finds its way, and from the plateau, which stretches away to the south, in front of the stone house formerly occupied by Mr. Davis, there is a beautiful view of the valley of the Woonasquatucket, the surrounding hills, and the city itself, with its clustered houses and its manufactories. The steep sides of the ravine, at the bottom of which the brook flows, are heavily wooded, and the rounded knolls approaching the ravine add to its picturesque beauty. The woods, which cover some acres of the grounds, abound in Oaks, Hickories, Birches, Chestnuts, with a mingling of Ashes, Elms, Maples, Hornbeams and other varieties, while Pines and Hem-

locks and Cedars add to the charm of the spot in winter-time. The largest Canoe Birch in the state stands at the foot of the bank, not far from the stone bridge, and there is a fine variety of shrubbery scattered about the place in pleasing groups.

Upon the borders of the Seekonk River, in the hilly eastern portion of Providence, a beautiful little promontory, containing about five acres, has been presented to the city by two citizens, Mr. W. P. Vaughan and Mr. Moses B. Jenkins. This wooded bluff, still wild and uncultivated and abounding in Oaks, fronts upon the Seekonk River, and commands a delightful view of that broad stream and its banks. It is called Blackstone Park, and a drive along the shore is in contemplation, which, when developed and extended past the spacious grounds of the Butler Hospital, which kindly consents to the use of its long river-front for this purpose, will furnish a most attractive promenade for carriages, bicycles and pedestrians. This parkway, called the Eastern Boulevard, will be a mile and three-quarters in length, and is to be two hundred feet wide, the central portion to be ornamented, and on each side a driveway forty feet wide. Through the ornamented portion a cable-road will be run, and provision made for foot-passengers. This drive, it is hoped, will be extended by Pawtucket, to whose borders it leads, for a corresponding distance through its own territory. In summer little steam pleasure-boats can easily run along the river to Field's Point, now belonging to the city, which is at present an uncultivated sandy cape running out at the point where the Seekonk, otherwise known as the Blackstone, empties into Narragansett Bay. This point, when properly planted and laid out as a pleasure-ground, will form a healthful and cool resort for the crowding inhabitants of the south-eastern portion of the city, and is separated from the Roger Williams Park additions by only a short drive, that could readily be made available as a parkway. It commands a fine view up the river and down the broad bay.

Numerous squares of one or two acres are scattered about the city as welcome breathing-places for the tired inhabitants, but the public-spirited gentlemen who have done such good work in the past have still more comprehensive schemes for the future. The Public Parks Association, with the enthusiastic and energetic head of the Friends' School, Mr. Augustine Jones, as its President, are urging the purchase of a great open space on the north of the city, formerly occupied as an encampment by the French in the time of the Revolution. Here are the cellars of the dwellings they once occupied, and, as Rochambeau Park, this fine tract with its wild landscape, is capable of becoming by cultivation a worthy monument to our old allies. On the north-west side of the city is a stretch of young timber of some seventy acres, known as the Bradley Woods. Among the young and thrifty trees are some venerable specimens of the former forest, and here it is hoped that the city will acquire another park which will be found already provided with a carefully tended forest of some fifty years' growth. From this point a fine view is to be obtained with a far-away hilly background.

Not satisfied with this even, the Park Association is agitating for the acquirement of a hill called Neutaconkanut, which is the end of a high promontory of land, projecting to the south from a range of hills into the large plain which surrounds Providence on the west and south. This hill is about 300 feet above tide-water, and at its base flows the foaming Pocasset River at a higher elevation, making the mean height above the upper plain about 200 feet. This hill was mentioned in the original deed from the Indians to Roger Williams as "Ye greate hill of Notquonchanet on the north-west," and was one of the bounds of the purchase, so that it is of classic interest to the Rhode Islanders. It is already a popular resort for thousands, who make excursions thither for the sake of the noble view which it commands, and to enjoy its fine natural advantages of trees and rocks and rills. There are three summits to the hill, and from the highest of these the eye stretches away south-westward over the closely clustered villages of the little state. Thornton and Cranston, Natick and Pontiac and West Greenwich, with their neighboring hills, are visible, and far-away Coweset Bay, and the white sails in the West Passage, with the islands scattered here and there. On a clear day Newport itself is visible, and the whole extent of the island of Rhode Island. To the east are more villages, and Providence River in its whole brief extent, from Rocky Point to the city, with the mill-covered hills of Fall River in full view. Then more hills, and Providence itself, with its extended suburbs, its busy factories, its lofty spires; while northward the view is bounded by other ranges of hills, until we are conscious that we are looking upon one-fourth of the area of the thriving little state, and have in view the homes of seven-eighths of its swarming and prosperous inhabitants. From the other sum-

mits one can see an equally striking spectacle of beauty and prosperity, one of the most pleasing being that of the fertile Pocasset valley, with its hundreds of acres of cultivated land, its farms and farm-houses and tiny villages. Through this valley winds a road which divides it, and bounding it on the west rises a darkly wooded range of hills stretching from north to south.

"Probably no spot in Rhode Island," writes the President of the Park Association, "equals this in those attractions which are the essential requisites of a rural park. Few have a more attractive outlook. Its beauties are natural, just as God made them. Huge rocks crop out boldly in various localities. Rocks, summits, hillocks, valleys and ravines seem to have taken their places without order, yet are they the more picturesque and varied. No building encumbers it, . . . thrifty woods have sprung up over an extensive area of the hill. Pure water flows from never-failing springs. The views from its summits of cities, country, wooded valleys and shining sea are far-reaching and grand. Add to this the great rocks and lovely ravines running down the slopes of this hill, and the whole combines in furnishing the natural beauties and essentials of a unique and noble park."

If the city of Providence avails itself of its advantages it will soon be unrivaled as a possessor of desirable recreation-ground. Its own singular beauty of situation demands the retention of such open spaces as may command the lovely prospect that opens about it in all directions. Prosperous, comfortable, growing with rapidity in extent and population, the chief city of Rhode Island does well not to fall behind in the march of taste and improvement which has begun in our land.

Hingham, Mass.

M. C. Robbins.

The Weeping Spruce.

IT had been my desire for the last three years to visit the group of Weeping Spruce (*Picea Breweriana*) growing on the summit of the Siskiyou Mountains, in Siskiyou County, California, and having learned this year that the other conifers in the northern part of the state were seeding I determined to visit the grove and obtain seed, if possible. In company with my father, Mr. Robert Douglas, of Waukegan, Illinois, we went to Grant's Pass, Oregon, the nearest railroad station to the grove, where we procured horses and drove the first day to Andersons, about twenty miles from Grant's Pass. Owing to heavy rains we did not reach Waldo until about four o'clock next day, where we engaged a guide, saddle-horses and pack-animals, and left for the trees early the morning after, reaching the "Big Meadows," on the summit of the Siskiyou, about four o'clock, having traveled about twenty-one miles in a horizontal direction and more than one mile in altitude. Waldo is about 1,500 feet above sea-level, and our camping-place was about 7,500 feet. The trail over which we came was made by a Spanish packer for the transportation of provisions from Waldo, Oregon, to Happy Camp, a mining town in California. It is a fair trail for such a rough country, but it is not a macadamized road. We slept that night with some evergreen boughs under us and the blue sky over us part of the night, and the most dense fog I have ever seen for the remainder of the night.

The next morning we walked up the trail about a mile and a half to the few scattering Weeping Spruces, about sixty in number, which had attained a height of twenty-five feet, at which size they begin to bear seed; but we found that most of the trees under fifty feet had very imperfect seeds. The cones are from two and a half to three and a half inches in length and three-quarters of an inch in diameter, of a fine purplish color. They mostly grow on the extreme top and ends of upper branches. The beauty of the trees far surpassed my expectations. They have the true Spruce form, tall and symmetrical, with horizontal branches, and a beautiful green color. In their general features they resemble a well-grown Norway Spruce, but their distinguishing beauty is in their long, pliant, pendulous branchlets, which hang straight down from the branches to a length of six or eight feet on the older trees, while they are no larger round than a lead-pencil (see page 595). They have a stately grace in calm weather, but their characteristic impressiveness is only seen when the long flexible branches are undulating in a light breeze or streaming before a gale.

The bark of this Spruce is thin, smooth and reddish in color; the wood is white and very tough. The tree felled several years ago by Mr. T. S. Brandegee for the Jesup collection shows no sign of decay as yet. The largest tree in this grove—if grove it can be called, where the trees are scattered over a space of fifty acres, mixed with Firs and Incense Cedars—we found to be by actual measurement 121 feet 6 inches high,

with a trunk two feet eleven inches in diameter seven and a half feet from the ground. Below that height the trunk swelled to a much greater size. Other trees were more than ninety feet high, with about the same diameter. My father left for San Francisco on the second day, but as the trees were seeding heavily I remained ten days longer and collected 800 pounds of cones, out of which we will get some twenty pounds of fine clean seed, the first, I believe, ever collected. I found another grove of about twenty trees some two miles from this one, but could see very few seedlings in either place. In both groves the trees were growing on the north side of the highest peaks, where the snow lies fifteen or twenty feet deep, as the mail-carriers' signs show, and I can therefore believe the Weeping Spruce will be hardy in most parts of the east.

Later in the season I made another trip to these groves to get as many seedlings as I could, and hunt up more trees if possible. Hunters and prospectors reported that they grew in various parts of the mountains, but when these men saw the branches I brought down they admitted their mistakes. Mr. Orrin Russell, who has lived in this part of the country for more than twenty years, and who is exceptionally well informed, reported that a few Weeping Spruces grew on the Coast-range in Oregon. I visited him at his mines after I had collected and shipped the few seedlings I could find on the Siskiyou Mountains, and in company with his brother, Mr. Joseph Russell, found the trees at the place indicated—on the summit of the Coast-range, on the divide between Cañon Creek and Fiddler's Gulch. This is the first time, so far as I know, that any record has been made of these trees in Oregon. We also discovered a few more about a mile south-west of the first grove. They are widely scattered, and in a dense forest of Firs and Douglas Spruce, and taller than those on the Siskiyou Mountains, but have a smaller trunk diameter. We spent two days collecting the seedlings. Mr. Orrin Russell informed me that he knew of about a dozen trees at the head of Sucker Creek, in the Siskiyou, which I would have visited had I not been prevented by heavy snow.

Larkspur, Cal.

Thomas H. Douglas.

North Carolina Notes.

A WEEK ago I visited Fayetteville, the head of navigation on the Cape Fear River. I have been raising a great number of Tea-plants, and had selected the neighborhood of Fayetteville as a favorable location for a subexperiment station for a Tea-plantation. The place lies in the upper Long-leaf Pine belt, where a slightly undulating section of sandy loam, underlaid with granitic clay, makes a warm soil, which seems peculiarly adapted to tree-growth. There is here an old neglected Tea-plantation, from which good tea has been made for many years. The fact that the plants have survived in a dense thicket of Pine, scrub Oak, Briers and Smilax shows their hardiness, and they seem to be getting almost naturalized; at all events, there are multitudes of young seedlings in the woods about the old plantation. At the time of our visit these plants were full of flowers, but the white petals were browned by the recent frost, though many buds still remained to continue the bloom.

On this old place we found a noble avenue, the trees in which were alternately evergreen Magnolias and Prunus Caroliniana. I have always regarded this last more as a large tree-like shrub than a tree proper. But here they stood almost as large as the old-fashioned Cherry-trees we used to plant in avenues in Maryland, some with trunks eighteen inches in diameter. The Magnolias were of like massive proportions. Nearer the old mansion the land broke into swelling undulations as it sloped toward the river, and here, with admirable taste, has been preserved a large area of the original forest-growth of the Long-leaf Pine. Never in all my experience have I seen a finer growth of this majestic tree, and the crop of seed this year is so plentiful that the ground was fairly covered with the dropping seeds. It may be many years before another such crop is made, for the Long-leaf Pine is rather shy in fruiting. Here, too, on the lawn, were great plants of Gardenia florida, with their latest flowers just crisped by the frost, but with glossy foliage untouched, testifying by their massive growth to the generous soil and hospitable climate.

When my business was over I spent a day looking about the old town for objects of horticultural interest. In one doorway, and only one, I saw Olea (Osmanthus) fragrans of fine size, from whose sweet blossoms the frost had not quite driven the perfume. In this same door-yard Magnolia furcata did not look altogether happy. Just across the street an old mansion had burned down the day before, and I wandered in the grounds, crowded with many interesting plants. Close by the still smoking ruins, two plants of Camellia, to match formerly

fine pyramids, now stood scorched and blackened, while the great Indian Azaleas, that stood by the portico, were evidently killed by the fire. Near by a Cryptomeria, nearly fifty feet high, was completely covered by a giant plant of Eleagnus reflexa. Out of danger from the fire stood the largest Cork Oak I have ever seen, though there is a larger one at Avoca, on Albemarle Sound, from which I have had acorns sent me this season. The Fayetteville people are evidently flower-lovers, for almost every door-yard has its little glass-covered pit for wintering over the pet Geraniums and Callas. The Oleanders kept company with the Gardenias outside, in many places sheltered by dense and closely trimmed hedges of Japan Evonymus. As in most other places, far-fetched things seem to be most valued, if I except the ever-present Laurel Cherry and Magnolia. In one place only I saw some plants of the beautiful Ilex vomitoria. One of these was loaded with its brilliant scarlet berries, looking as translucent as glass beads. I am exceedingly sorry it seems necessary to go back to the name "vomitoria" for this beautiful shrub, Cassine was so much more pleasant. The common name here is "Yaupon," probably the old Indian name. The pretty Laurel Cherry, Prunus Caroliniana, is here called Mock Orange. Osmanthus Americana, the American Olive, one of the handsomest shrubs of our coast, I did not find cultivated anywhere.

The front yards were pleasant, and I strolled around the back streets to peep at the vegetable gardens. Alas, what a poor appreciation people have of their climate. Not a vegetable did I see, except some unhappy, worm-eaten Collards on stalks two or three feet high, and a few Turnips. No Lettuce, no Radishes, no Kale, no Spinach; no cold frames for heading Lettuce free from frost-marks. And yet, in this warm, sandy soil and genial sunshine, these hardy vegetables would be just in their element now. But the Fayetteville gardens showed fewer vegetables than the snow-buried gardens of the north. In my own garden in the colder clay soil of Raleigh there is not a day all winter in which we do not have fresh vegetables from the garden, and here, in a warmer soil and seventy-five miles further south, not a green thing could be seen in the kitchen gardens but that gaunt burlesque of a Cabbage, called the Collard. Only a few days before, I had dug my late crop of Irish potatoes, grown since August, and here was a thriving town living on northern potatoes at \$1.50 a bushel, with stalks of the "roasting-ear" corn still standing in the gardens since the June crop was eaten.

Raleigh, N. C.

W. F. Massey.

New or Little-known Plants.

A Double Morning Glory.

IN our issue of October 5th, page 480, we spoke of having received from Mr. Curtis A. Perry, of Braintree, Massachusetts, specimens of a double-flowered Morning Glory, *Ipomœa purpurea*, or, at least, of a plant apparently identical with *Ipomœa purpurea* in all its characters except the corolla; the calyx, which is also sometimes doubled, being especially well marked by its shape and pubescence. The leaves were almost as large as those of *Aristolochia Siphon*, and the flowers, which were very much doubled, were a blush white and streaked with light purple. Photographs of the plant showed that it was rampant in growth and profuse in bloom, the flowers standing out boldly beyond the leaves. The seed first came from Mexico three years ago, and the seeds from the plants then grown have produced plants in which for three years the flowers have come true to their double character. The plants begin to bloom out-of-doors in September, but one of them, when cut back last autumn, flourished well as a pot-plant in an ordinary furnace-heated house.

After these notes were published, Mr. Sylvester Baxter, of Boston, wrote us that he was with Mr. Perry, visiting the little tropical city of Cuautla, when they first observed among other plants a strange-looking flower on a vine which was romping over the corridor of the second story of the hotel where they were stopping, and, from time to time, gathered seeds as they ripened. The first year both Mr. Perry and Mr. Baxter raised plants, which bloomed abundantly. The plants flower much later than the single variety, even when growing side by side with it under the same conditions, so that it is difficult to obtain mature seed from outdoor plants before autumn frosts cut

them down. This year they were covered with flowers early in September, and they still presented a good appearance when Mr. Baxter wrote in the middle of October. As to the general appearance of the flower,

Mr. Faxon's drawing, reproduced on this page, very well shows its characters.

In Dr. Masters' *Vegetable Teratology* it is noted that dialysis has been observed in *Pharbitis* as well as *Convol-*

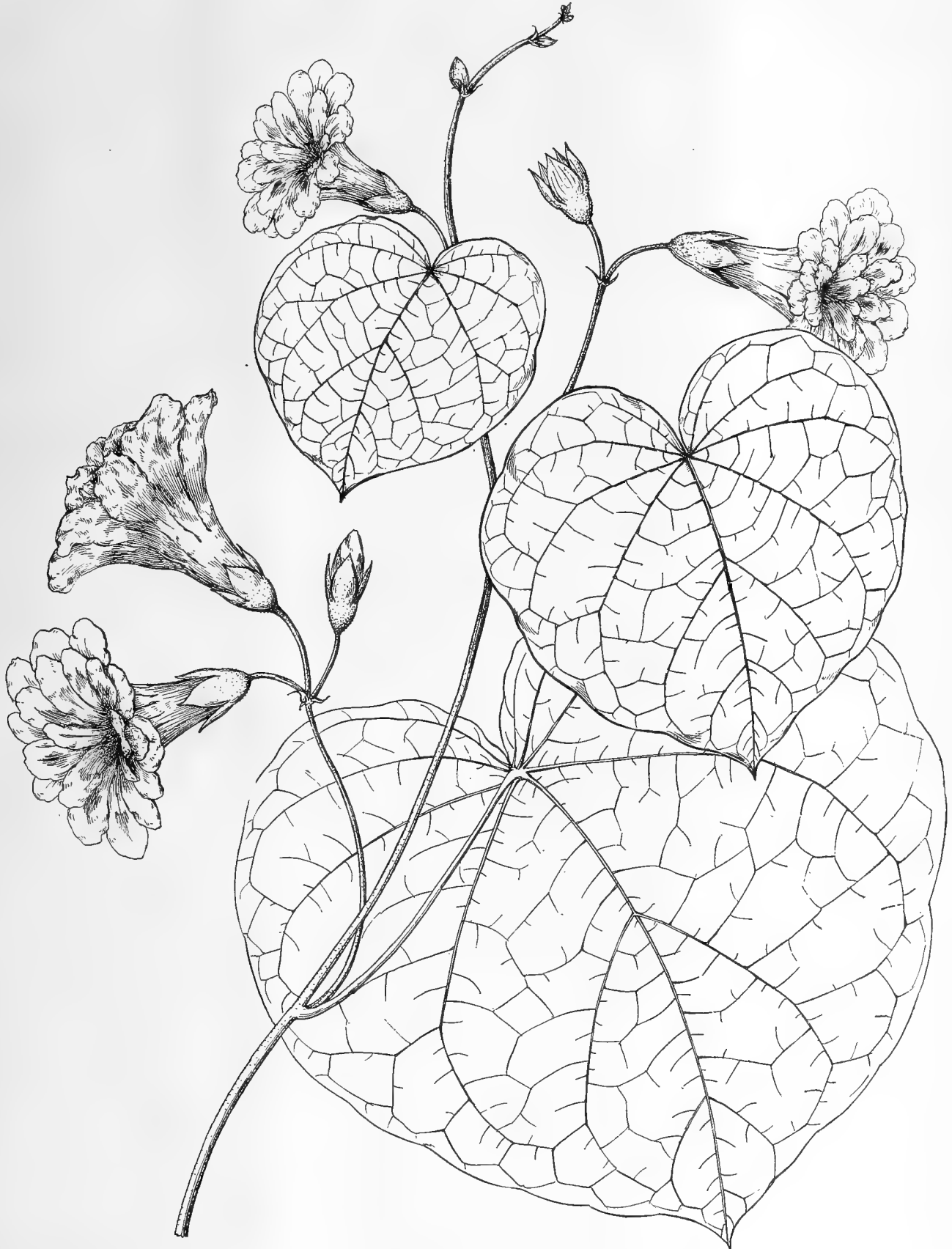


Fig. 101.—A Double Morning Glory, *Ipomoea purpurea*.—See page 592.

he writes that the "numerous petals standing somewhat apart form a light little cluster of striking delicacy, which gives the flower a fluttering or bird-like aspect."

vulus, *Pharbitis* being now included in *Ipomoea* and in the section of the genus to which *Ipomoea purpurea* belongs. It is more proper, however, to call this doubling or

multiplication of the parts of the corolla a case of pleiotaxy. Dialysis is merely the separation between parts primarily undivided, as when an ordinary gamopetalous corolla is divided into five distinct petals. Examples of pleiotaxy among Polypetalæ, such as Roses, Pinks and Anemones, are very familiar, and among Gamopetalæ it has been noted in *Datura*, *Campanula*, *Primula*, *Arbutus*, *Nerium* and *Gardenia*. Dr. Masters makes no mention that it has been observed in *Ipomœa*, or any member of the family, so that this plant has exceptional interest botanically as well as on account of its horticultural value.

Cultural Department.

How to Grow Cyclamens.

THE Massachusetts Horticultural Society, in making its awards last year, gave a premium to Dr. G. C. Weld, of Brookline, for the successful cultivation of Cyclamens, and the Committee on Gardens, in their report, publish a paper by Mr. Kenneth Finlayson, Dr. Weld's gardener, in which his method of growing these flowers is explained, and which we now reproduce :

I sow the seeds about the 1st of December in a compost of fibrous loam and well-decayed leaf-mold, in equal parts, adding thereto a liberal dash of sharp, clear sand, with a further quantity of finely crushed charcoal to keep the whole porous and sweet. The top layer of soil in which the seeds are immediately sown is more sandy and more finely sifted than the rest of the earth. Ordinary earthen seed-pans are used for this purpose, the size depending on the quantity of seed to be sown, an eight-inch pan being sufficiently large to contain two packages of seeds such as we buy from seedsmen. Good drainage in the bottom of the pan must not be neglected. When the seeds are sown and watered well with a fine rose, the pans are placed in sphagnum moss in a mild propagating-bed of a temperature of sixty degrees. I cover the pans with a pane of glass to check evaporation, and thereby avoid the necessity of frequent watering, which ought to be particularly guarded against.

In this temperature, named above, the seeds will germinate in from four to six weeks. After they have formed a leaf they are taken into less warm quarters, and near the glass, but shaded from the bright sunlight for some time. When they have made two or three leaves I transplant them into boxes, using compost much the same as at first, but less sandy, keeping them all the while close to the glass at this period of their existence, in order to have a sturdy and stocky foundation to build on.

They are put out into cold frames early in summer, but still kept in boxes, guarded against cold draughts and sudden changes in the weather, until they get sufficiently hardened to stand some little rough usage. I syringe them morning and evening in hot dry weather, and shade them only from the fierce noonday sun, using lath shades for the purpose; the sash is removed entirely at night when the weather is favorable.

About the 1st of June I pot them into three-inch pots, using at this potting a little well-decayed cow-manure, though sheep-manure is preferable in this compost. They are returned to the frames again, and the pots are plunged up to their rims in coal-ashes. They must be carefully watered for weeks after this operation, and syringing overhead morning and evening must be steadily adhered to. With this treatment diligently persevered in they will be ready for another shift into larger pots about the 1st of September or sooner. At this shift a five-inch pot is chiefly used, this being the pot in which they flower. In a few exceptional cases there may be some plants that outgrow the others to such an extent that a six-inch pot may not be any too large.

The earth used in the final potting consists of three-fifths fibrous loam; the other two-fifths consist of leaf-mold, cow-manure or sheep-manure, and sand, the leaf-mold predominating. Particular care should be exercised when potting the Cyclamen that one-half at least of the bulb be left above the potting-soil, for it is from the top surface of the bulb that the flowers proceed, and if this is placed under the earth the flower-buds will surely rot.

I keep them in their quarters in the frames until the middle of October, before taking them into the greenhouse. After they are brought into the greenhouse they have as light and airy a position as possible. I keep them on the front bench of my Pink-house, in which place they do admirably well, the

temperature at which this house is kept, namely, from fifty to fifty-five degrees, being, in my opinion, the ideal Cyclamen temperature. Indeed, fifty degrees is quite high enough; if kept steadily at that point the plants will be more healthy, and give more and finer-colored flowers.

They begin flowering sparingly eleven months from the date of sowing, but will not come into full flower until thirteen months from that time. I commence stimulating when they begin to form their flower-buds, or sooner should the pots be well crowded with roots, my never-failing stimulant being Peruvian guano, or its best imitation; also, soot and guano in equal parts, mixing them thoroughly before using. A small handful of any of the above fertilizers, dissolved in a six-gallon can full of water, is used once a week should the weather be clear, so that they demand much watering; otherwise, the watering is less frequent.

Cyclamens thus treated will continue to flower until late spring or early summer, when they will show signs of a want of rest; this rest must be brought about gradually, and should never be too severe—that is, never so severe that they will lose all their roots and foliage. Old plants are turned out of the pots some time in June, all the soil is shaken from their roots, and they are then planted in frames, giving them a thorough watering, to settle the soil about them. Afterward a nice layer of short grass is laid over all to keep the soil cool and moist.

I also shade the glass with a heavy coat of paint, and keep the sashes at all times raised at both ends four or five inches, to secure a current of air over them continually. All this done, there is no further attention necessary except a watering at long intervals, until they show some signs of activity, which will be about the beginning of August, when the grass covering should be removed, in order that the young leaves which will now start will have a chance to develop. The soil from this date is kept more moist.

In the third week of August they are repotted and treated like the younger plants—that is, they are plunged in ashes and syringed overhead twice a day if the weather demands. Under such treatment I get flowers as good in every particular from old plants as I do from younger ones, and a great many more of them.

Diseases of the Carnation.

THE enemies of the Carnation are numerous. There is, for example, the rust (*Uromyces caryophyllinus*, Schr.) that has already ruined many beds and many more are doomed. This fungus works in a very obscure manner until it has undermined the constitution of the plant and then it shows itself in great brown dusty patches upon leaf and stem. It is a genuine rust and is closely related to the forms upon grass and grain. Its habits are such that to stamp it out requires the heroic treatment of fire. Spraying may prevent its spread to healthy plants, but nothing can be put on an attacked plant that will rout the deeply seated enemy. A recent letter from Nebraska reported it in that state.

But while this rust is a bad enemy it is not the only one. It gets the credit due to other foes. When samples are sent to the station the first question is this: "Is this the rust?" And more often it is not the rust. One of the most common Carnation troubles is what may be called the leaf-spot. This is caused by a fungus that is somewhat local in its work, at least may be confined to one small spot while all other parts of the plant are entirely healthy. As a rule, however, a plant that is attacked in one place will be a victim elsewhere. These spots are at first somewhat swollen or thickened patches which soon become brown or even almost brick-red in color, and later, dotted with blackish specks, which are the places where the spores are produced and ooze out when mature and the surface is wet. By means of these multitudes of spores the fungus is able to spread rapidly through a house if affected plants are permitted to remain untreated. From the nature of this trouble it is quite evident that it is amenable to the ordinary treatment for fungus parasites.

Last winter a large grower of Carnations volunteered to treat his plants affected with blight as follows: One-half of a large house was sprayed each week with a solution of a half-ounce of sulphide of potassium to a gallon of water. He was so well satisfied that he soon extended the use to all his houses and felt the remedy was of great value to him.

Another Carnation trouble is an anthracnose, and, while this is bad upon large plants, it is the most destructive to cuttings. This *colletotrichum* appears upon the surface of the stems and bases of the leaves as small black specks which, under the microscope, are made up of spores and dark stiff hairs. It is

fond of moisture and is usually located near the base of the plant, but its threads reach throughout an affected plant. When cuttings of a diseased plant are placed in the sand the new conditions of additional moisture favor the fungus, and soon the stem softens at the base and the black specks appear upon the surface of the decaying tissue. Shortly the cutting has rotted off. It is, therefore, very important to use healthy stock for the cutting-bed. This is sometimes illustrated in the propagating-bed when all cuttings from certain plants fail while others from neighboring stock do not.

The last trouble to be here mentioned differs very much from all those above given. The affected plant shows no rust-patches, no colored spots of the Septoria or black speck of the colletorichum species. The whole plant is sick, fails to grow and bloom, and the leaves have a shriveled or somewhat wrinkled appearance, with peculiar minute ashy or yellowish markings, as if something had scratched the leaf internally. There is no sign of any insect at work and no filamentous fungus. Bacteria swarm in the faded streaks, but they may follow

Mrs. Isaac Price very much resembles the old Golden Dragon, except that its flowers are sulphur-yellow. It makes a very handsome low-growing specimen. For the reason that its hooked and twisted petals interlock, it is useless for shipping, either as specimens or cut flowers. Its cut blooms do not associate with other varieties, or even in groups by themselves, but singly in glass bottles or small vases they are superb.

O. P. Bassett is another variety introduced last season, and generally condemned because of its lateness. A friend of mine speaking of it says the color is precisely that of the famous G. W. Childs, deep velvety crimson, while its blooms are equal to that variety in size, and superior in form, being quite double. Whether or not it will make a good bush specimen I am unable to say.

Syringa has always been too late for the exhibitions here. Once it had many admirers; now it is nearly forgotten on account of its lateness. It is an excellent kind for cutting, making large, elegantly incurved, flesh-pink blooms. Molly Bawn is

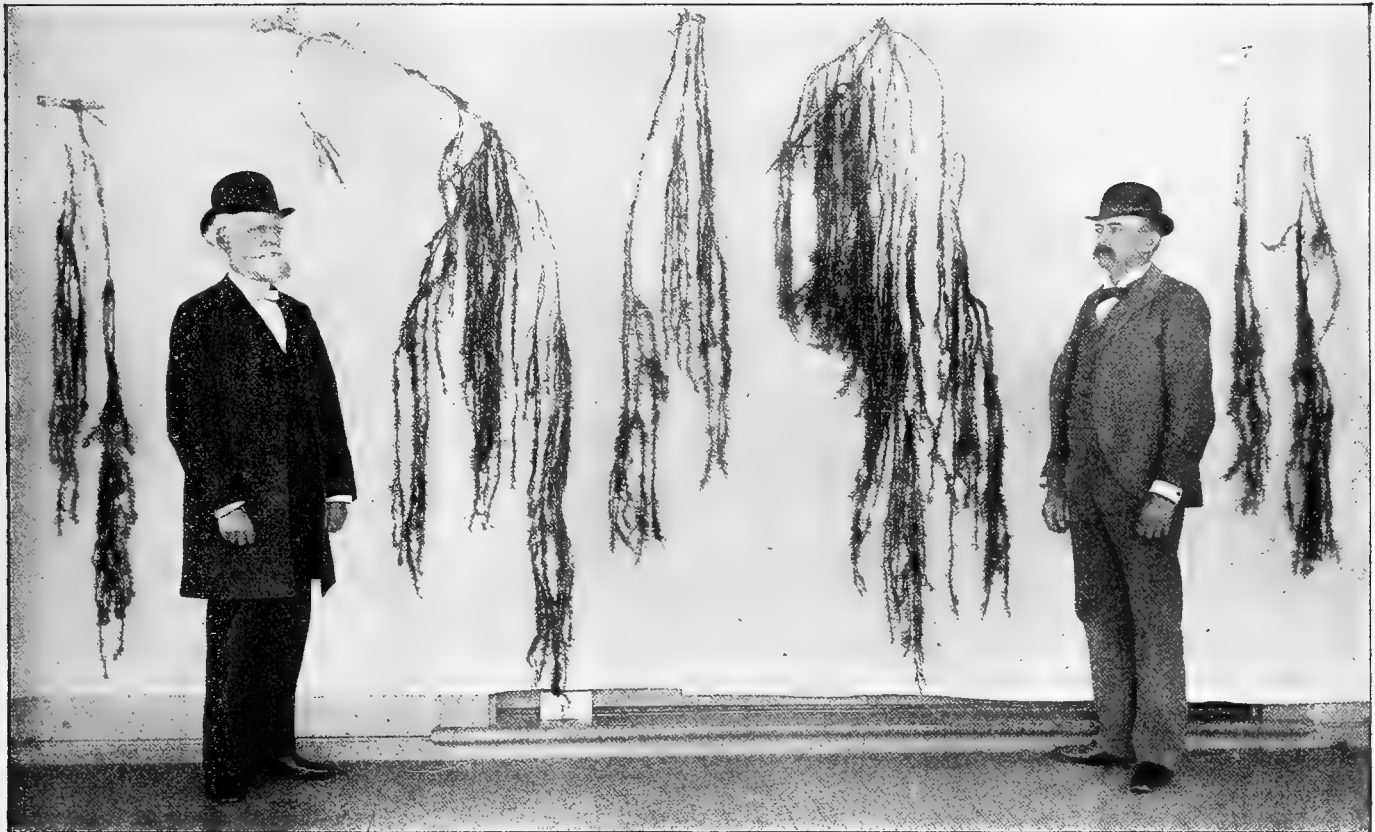


Fig. 102.—Branchlets of the Weeping Spruce (*Picea Breweriana*).—See page 591

and not precede the disorder; it may be that the trouble is at the root. Persons in sending specimens that answer to the above-attempted description should include the root.

Rutgers College.

Byron D. Halsted.

Late Chrysanthemums.

WHEN the Chrysanthemum exhibitions are over there seems to be a general feeling that the season has gone by. What few remain must be varieties with special qualities to commend them. So late in the season it is hard to endure any but the best, and little attention has been given to late varieties by raisers.

Ethel is a white-flowered, straight-petaled Japanese sort; good either for specimens or cut blooms, and it comes into bloom about Thanksgiving. If kept cool, many flowers will hold until Christmas. Mrs. H. J. Jones is a yellow sport from Ethel, and identical in every particular except the color of its blooms.

C. B. Whitnall, one of last year's introductions, is a Japanese incurved kind of great merit. It certainly is the best late variety of its color, which is a deep claret, with silver-lake reverse. Its habit is all that can be desired, either for bush specimens or cut blooms.

a pure white sport from it, and among the handsomest of the late white bloomers.

Gold-finder has never bloomed in time to exhibit. The blooms are of an uncommon type. Their chief beauty lies in the infolding of the florets with age. A handsome yellow one of this type, named Gloriana, was exhibited by Mr. J. V. May at the late Madison Square Exhibition. White Cap, a recent importation of Halleck's, is another late variety having the same peculiar character of bloom. This year has added some pink and violet colored ones to the list which will be sure to come into favor.

Mrs. Humphreys I consider the best late white for any purpose. It makes a handsome specimen. The blooms are supported on good stiff stems. The florets are stiff, close and straight, fitting it especially for shipment. It is, moreover, sweet-scented. Marvel created quite a sensation a few years ago when introduced by John Thorpe. The blooms are particolored, the outer florets being white, centre bright pink, making a striking contrast. It grows into a cheerful-looking specimen, and very few visitors pass it by without some complimentary remarks. Marvel is seldom seen now, mainly from the fact, I suppose, of its being late. We only once had it in time for exhibition.

Wellesley, Mass.

T. D. H.

The Chrysanthemum is so universally popular in its regular season of blooming—that is, through October and early November—that it has practically displaced the Rose in those two months, and we now have the Queen of Autumn usurping for a short season the place of prominence which has been held for centuries by the Queen of Flowers. Commercial growers are always alert to supply every new want and cater to every change of public taste, and they have, therefore, endeavored to prolong the season of a flower which has been so generally admired. Efforts to force it into perfection before its natural season have been made throughout the country until the attempts to grow early Chrysanthemums are well-nigh exhausted. The late season still remains, and I, with others, have labored hard for eight or ten years to extend the blooming season in that direction. My efforts have met with considerable success, because some of the very latest varieties now in use are seedlings of mine; and yet I sometimes question whether this effort to prolong the Chrysanthemum season beyond its natural limits is wise or profitable. At least, I have never been able to sell as many plants or flowers of exceptionally early or late varieties as of those which are at their best in the mid-season. People seem to grow weary even of beauty when it is overabundant; nevertheless, I will name a few of the late varieties which, in my estimation, are among the best:

Mont Blanc is a large white incurved flower which shows an eye. Its blooming season is from late November till the middle of December. Another good white flower is Flora Hill, a large reflexed variety, which blooms from the middle to the end of November. Mrs. John Westcott is another reflexed white of the same season. John Lane is a soft pink incurved flower which also blooms in late November. The finest late pink in cultivation, however, is Mrs. Charles Dissell, a very large incurved flower, which is good from late November to Christmas. Gold is a deep yellow reflexed flower, which is good during the first half of December, but the best bright yellow of all late-blooming Chrysanthemums, and one of the very best Chrysanthemums of any color is Miss Eva Hoyt, a large incurved flower, which blooms in late November and into December. The latest of all, and a very good one, too, is Mrs. H. A. Pennock, a large incurved bronze-yellow, which commences to flower about the 1st of December and lasts quite through the month. Indeed, it might be called a New Year's flower.

Philadelphia, Pa.

W. K. Harris.

We have found in Philadelphia that Mont Blanc, although not quite up to the exhibition standard, is a first-rate variety, and its natural tendency to come late makes it exceedingly valuable, and the same is true of its lemon-colored sport, identical with it except in color. Gold, which is also known as Mrs. R. Elliott, we have also found good for late work. Potter Palmer, one of the more recent introductions, is an admirable late white, and so is Pelican. Dr. Covert, one of last year's introductions, promises well for late use. It is very large, incurved quite double, and the yellow of its florets is streaked with red. Flora Hill and Mrs. John Westcott are both inclined to be late, and the first-named is one of the very best of keepers we have. In extending the Chrysanthemum season, that is, to secure early Chrysanthemums as well as late ones, there is a great deal in management, and some flowers can be hurried and others held back by one who knows how to select and how to manage them.

Chestnut Hill, Philadelphia.

Edwin Lonsdale.

Orchid Notes.

ZYGOPETALUM INTERMEDIUM is considered by many Orchid-growers a variety of the well-known *Z. Mackayi*, the only difference being that the lip of one is glabrous and that of the other pubescent. The flowers, averaging six in number, are arranged alternately on the upper portion of the erect stem, and are about three inches in diameter. They appear during the winter months, and last some six weeks in full beauty. They are quite fragrant—a fact seldom noticed by writers, and one of some importance to those who might grow the plant in order to cut the flowers for decorative purposes. They are well adapted to this use, as they all expand about the same time and last in water nearly as long as upon the plant. The sepals and petals are oblong, green, richly marked with brown, and spreading in the form of a semicircle; the protruding white lip is rather more than an inch and a half in diameter, the entire upper surface being beautifully marked with purplish blue. Flowering profusely, and easy to grow, the plant must certainly be classed among the most useful of the Orchid fam-

ily. It should be grown in a well-drained pot or pan, using good fibrous peat for the roots. The peat may be lightly surfaced with sphagnum, to preserve the roots in the moist, not saturated, condition, which is always desirable.

PLATYCLINIS COBBIANA is a pretty little Orchid now flowering freely. It is not showy, but its long arching racemes have few rivals in gracefulness. The slender raceme proceeds from the top of the pseudo-bulb, and is about eighteen inches in length, the terminal half supporting from forty to fifty flowers, each nearly half an inch across. They are of whitish color, with conspicuous bright orange lip. *P. Cobbiana*, like the other three species of the same genus which are in cultivation, is a native of the Philippine Islands, whence it was introduced in 1879. No two of the species known in gardens flower at exactly the same time, and thus one is seldom without flowers on some one of the plants where all are included in a collection. *P. uncatata* closely succeeds *P. Cobbiana*, and is followed in spring by *P. glumacea*, while *P. filiformis* (figured in GARDEN AND FOREST, vol. ii., p. 485, under the name of *Dendrochilum filiforme*) blooms in early summer. The last two are especially elegant plants, and the flowers of *P. glumacea* are delightfully odorous. They all grow luxuriantly in a stove, and should be potted in peat and sphagnum, with good drainage, soon after flowering. The roots should always be moderately moist; but when the plants are growing vigorously, the supply of water should be liberal. The name *Dendrochilum*, which is frequently used in connection with these plants, belongs more correctly to an allied genus.

Cambridge, Mass.

M. Barker.

House-plants for Shady Windows.

IN the effort to establish a window-garden various disadvantages are encountered, not the least of which is found in adapting to this purpose a window which enjoys little or no sunshine, although such windows are sometimes the only available ones. This naturally makes the selection of the plants more difficult than where all the advantages of full sunlight are enjoyed, but still it need not discourage the window-gardener, for a very pretty mass of greenery, as well as some flowers, can be grown, even under these conditions.

As might be expected, foliage-plants will occupy a prominent place in a window arrangement so situated, and at the head of the list of suitable subjects should be placed the *Aspidistras*, plants which possess such vitality that sunlight seems a secondary consideration. Either of the varieties of *Aspidistra* will be found satisfactory, though *A. elatior* and its variegated form are the best, the latter being generally more dwarf in habit than the type, and, like it, in needing repotting only at long intervals. The *Begonias*, also, are shade-loving subjects, and the beauty of foliage and flower combined in this extensive genus gives considerable variety from which to choose for the window-garden. The *Rex Begonias* are invaluable for this purpose, their massive many-tinted leaves adding much to the effect, and *B. metallica* is also excellent, being a strong and rapid grower, and pretty both in foliage and flower. *B. nitida* is another handsome, strong-growing species with large glossy green leaves and panicles of rose-colored flowers, while *B. rubra* makes an admirable companion plant for the above, its flowers being very large and bright red. If still more variety is needed among the *Begonias*, we may add *B. Saundersii*, *B. semperlorens* and *B. manicata*, for, though the latter sort is a cropper in blooming, yet it is so graceful and pretty when in flower as to be a general favorite.

Calathea zebrina can also be safely recommended for a shady window, though it should be borne in mind that this plant will not thrive if allowed to get very dry, nor in a room in which the temperature falls below fifty-eight or sixty degrees at night. A nicely berried plant of *Ardisia crenulata* will do much to brighten the window-garden, its glossy leaves and bright red berries reminding one of Holly, without the prickles. It is advisable, however, in getting plants of *Ardisia* that they should be not less than five-inch-pot size, as they seldom bear berries before that size, and it should also be remembered that they cannot endure defective drainage and stagnant moisture at the root.

Fatsia Japonica, or *Aralia Sieboldii*, is another good subject for the window, and will flourish in spite of draughts and lack of sunshine, its large deeply lobed leaves of dark green being very ornamental, and, for variety, one or more of the variegated forms may be added, though these may not prove to be quite so hardy as the type. *Clivea miniata* is another excellent house-plant, its strap-shaped leaves being evergreen, and the strong spikes of orange-flowers will appear at indefinite times

throughout the year. This plant is very easily grown, and requires no more care than an *Agapanthus*, though it is rather more tender than the latter, and, like most of the *Amaryllids*, needs a certain degree of rest previous to flowering, but not absolute drying off.

The Bow-string Hemp (*Sansevieria Zeylanica*) is also a plant of accommodating habits, and will flourish in the shade, while the dust and dry air of a living-room seems to have but little effect on it. It has long, narrow, erect leaves, the ground color of which is dark green, curiously mottled with grayish white.

The dwarf Papyrus (*Cyperus alternifolius*), and also its variegated variety, may be used with good effect, the most essential point in their culture being an abundant supply of water.

Peperomia maculosa is a pretty little plant with thick fleshy leaves that are marked with silvery variegation, and should be grown in small pots or pans with an abundance of drainage material, since it is essential to the welfare of this plant that it should not be overwatered, especially during the winter.

Some Palms may be used for a sunless window, for, while most of them are improved by a measure of sunshine, yet it is not absolutely essential for all, and among those best adapted for the present purpose are *Kentia Forsteriana*, *K. Belmoreana*, *Rhapis flabelliformis* and *Livistona Chinensis*, all of which will flourish with reasonable care. From the Ferns a number can readily be selected, those having fronds of firm texture being most reliable for household use, among these being *Polystichum acrosticoides*, *Pteris serrulata*, *Nephrolepis exaltata*, *Pteris Cretica* and some of the Maiden-hairs, *Adiantum Capillus-Veneris* and *A. cuneatum* being probably the most reliable of these.

For carpeting the surface of the soil in some of the larger pots *Selaginella Kraussiana* is useful, and makes a very pretty covering in a short time, and seems to enjoy the shade. The Variegated Periwinkle (*Vinca variegata*) may be put to good use in draping the plant-stand, for, while this handsome vine grows vigorously in the full sun, yet it may also be grown in the shade to entire satisfaction. All the plants thus briefly noted may be grown in any reasonably good loam, and, with proper care in watering, will make themselves thoroughly happy and at home.

Holmesburg, Pa.

W. H. Taplin.

Notes from the Harvard Botanic Gardens.

CURCUMA ROSCOEANA.—This interesting and highly decorative plant is a tuberous-rooted stove-herb, sending up in spring several elegant arching leaves with slender sheathing petioles from eighteen to twenty-four inches long, and oblong-oval blades of pale green color two-thirds the length of the petioles. The scape, twelve inches high, appears in summer, and the upper portion is a dense mass of concave, rich orange-scarlet bracts. The flowers are tubular, with two spreading lips about three inches in length and of light yellow color. They are produced singly at the base of the curved bracts, which enclose the lower part, leaving only the limb visible. The bracts retain their brilliant color for several months, but the flowers soon fade, though they are repeatedly replaced. *C. Roscoeana* is found on the coast of Tenasserim, in the East Indies, whence it was introduced in 1837. A moderately high temperature is necessary to its satisfactory development, and it seems partial to slight shade; the color of the bracts, at least, is longer preserved when the plant is grown in a shady position. It requires to be kept quite dry in winter, and the roots should be shaken free of the soil in spring and repotted firmly. A free supply of water is essential until the leaves begin to turn yellow, when it may be gradually discontinued. The roots are easily divided, and the plant is readily propagated by that process.

EUCHARIS GRANDIFLORA.—This plant, better known, perhaps, as *E. Amazonica*, or the Amazon Lily, is an old tenant of our stoves, but it is none too common nowadays. The mite (*Rhizoglyphus echinopus*), which worked such havoc among the bulbs a few years ago, influenced many in parting with the plant, and deterred others from beginning its cultivation. Little complaint is now made of the insect, and the plant should be restored to favor. The pure white, drooping flowers, of heavy substance and four inches in diameter, are borne in large clusters at the top of erect scapes two feet high. It is seldom that more than two or three blooms are fully developed on a single scape at the same time; but they open in such constant succession, and the scapes are produced in such profusion, that the plants form most pleasing objects for weeks together. There is nothing more effective than the contrast between the luxuriant leaves and chaste flowers of

this plant, and the flowers have the further advantage of an extremely grateful odor. They are produced at various seasons, more abundantly in winter than at any other time, and the plant delights in moderate activity throughout the year. It should be grown in large pots or pans, placing a quantity of the bulbs four inches apart in each, and the soil should consist of rich turfy loam, fibrous peat and thoroughly decomposed cow-manure in equal parts, adding a small amount of lumpy charcoal. Perfect drainage is of primary importance, for the *Eucharis* requires a large supply of water, and frequent repotting is not advisable unless the plants are in poor health. They may be safely expected to bloom every three months, and for a fortnight before the buds expand, manure water may be administered every other day.

Cambridge, Mass.

M. Barber.

Correspondence.

Fructification of the Grape.

To the Editor of GARDEN AND FOREST:

Sir,—Many of our varieties of Grapes occasionally bear defective clusters; some of the berries remain green, and not larger than bird-shot, throughout the season, while other grapes of the same bunch grow to full size and maturity. This imperfect ripening has been ascribed to deficiency of pollen, and it is advised to plant in the vineyard a few pollen-bearers—"male vines"—to provide for this deficient element of fructification. By many viticulturists this abortion of fruit is accounted for by "the reflexed stamens" in certain sorts of Grapes, these organs bending outward and downward away from the pistil, and thus failing to impregnate the stigma.

These explanations seem plausible, but further notice of this imperfect fructification makes me question their soundness. The reflexed stamen is natural to the *Riparia* Grape and to its relatives. The more frequent examples of this defective fruitage may be seen in the pure *Riparias*, yet even here there are exceptions, notably in the *Clinton*, which with me forms perfect clusters. The *Concord* Grape (a *Labrusca* with erect stamens) never shows this imperfect fruitage. On the contrary, the *Ives* (also *Labrusca*, with erect stamens) is often thus afflicted. The crop of *Ives* in 1890 was characterized by numbers of these aborted grapes, while in an enormous fruitage of the *Ives* in 1892 all of its berries developed to full maturity.

In capriciousness of fructification, however, the *Iron-clad* Grape is especially puzzling. It is a natural hybrid between *V. Riparia* and *V. Labrusca*, with reflexed stamens. Soon after I first fruited this Grape, in 1876, I exhibited samples of it at the Centennial Exposition. Each lateral then bore five or six perfect clusters, the berries all fully formed and matured. The vines bearing this fruit were nearly as densely crowded with clusters in autumn as they were with foliage in summer. They were planted in a block of a thousand vines, all the one variety, set six by nine feet apart. Their wood-growth was rampant, single stocks making in one season several canes each from twenty to thirty feet long, with luxuriant lateral branches. Pruned in the same manner as were the *Concord* and *Ives*, on the so-called renewal system, that is, with two canes, with six buds on each, these *Iron-clad* vines as they grew older began to set imperfect clusters, and in a few years it was difficult to find half a dozen fully developed berries on a cluster, all the rest being little green abortions, clinging to the stem, and thus remaining throughout the season. I then left one row of these vines unpruned; these fruited full of nearly perfect clusters, while the vines in the pruned rows gave the usual defective bunches.

In close vineyard culture this non-pruning method is hardly practicable, and I tried the plan of letting a few vines run along the trellis as far as they might grow, their laterals being spurred to one bud. Near the extremities of these long canes the clusters were full and perfect, while near the stock they were made up of chiefly aborted berries. As the reflexed stamen is a constant character of this variety, if such stamens are the cause of abortive berries, this defect should have been seen in all the clusters.

The behavior of the *Ives* Vine in this respect is also perplexing; having erect stamens, why should it sometimes bear imperfect scraggy clusters? The evidence apparently contradicts the theory. Years ago, to test the *Iron-clad's* ability to resist the black-rot, I planted many of these vines along a trellis intermediately with *Concord*s, the vines of both sorts intermixing on the wire. Growing thus the *Iron-clad* annually fruits bountifully, with perfect clusters. It might be argued that here the *Iron-clad* blossoms are impregnated by pollen from those of the *Concord*; but, unluckily for the force of this reasoning, the blossoming of the *Iron-clad* is over, and its fruit

is formed before the Concord flowers are opened. There is an interval of ten days between the blossoming of the two. It is certainly remarkable that the only old Iron-clad vines on my farm which bear annually full crops of perfect bunches are those growing interspersed with vines of Concord and of Ives. Remarkable, too, that the same is true of those which are left to grow without pruning. I have planted Iron-clad vines at the foot of each Apple-tree in my orchard, letting them climb as they will through the tree-branches. Thus growing they fruit perfectly, in spite of the reflexed stamens. We know that pollenization is essential to fructification, but it is by no means certain that all Grape-blossoms which have both stamens and pistils may not always be competent to their own impregnation, notwithstanding the reflexed form of the stamens. These organs are not reflexed until the cap is shed from the blossom. I am assured by an eminent botanist that "the Grape stigma is certainly pollenized from its stamens before the cap falls from the flower." Hence the theory that pollen-bearing vines, male vines especially, should be planted in the vineyard to aid fructification seems unsound. For some fifteen years I have practiced on this theory, growing pollen-bearing vines scattered through my vineyards, yet I have never seen results from so doing which might not be as well ascribed to other causes. I suspect that a full fructification of the Grape-vine is greatly dependent on the nutrition of the plant, on accidents of the season and on the sterilizing influence of sundry fungus germs. Since I have been making experiments in vegetable pathology I think I have seen a marked benefit to fructification by spraying the vine when in full bloom with the Bordeaux mixture.

It has been suggested that for the development of the pulpy or edible part of the fruit the normal development of the seed is essential, and that, therefore, elements of plant-food which largely contribute to the growth of the seed, notably phosphoric acid and potash, should be supplied. It is true that the portion of my vineyard where the fruiting of the grapes with reflexed stamens was heaviest had been heavily treated with superphosphate of lime. Against the plausibility of this theory stands the fact that good seedless apples and pears and other fruits are not rare.

The sum of the matter is that the process of fertilization is not yet fully comprehended, and that we are still far from a scientific solution of many of nature's mysteries.

Vineland, N. J.

Alex. W. Pearson.

Roses in California Without Irrigation.

To the Editor of GARDEN AND FOREST :

Sir,—Two young ladies of Oakland, who conduct a Rose-nursery here, grow their stock from cuttings of mature wood taken in the latter part of autumn or in winter; these are put as soon as possible into nursery-rows where they are to grow. The rows are far enough apart to admit of cultivation with a horse. It so happened last winter that the cuttings could not be planted until well into February. For the most part they rooted well, and at once commenced a vigorous growth. In May the plants of La France, of which a large stock was put in, commenced to bloom just one month later than the plants from which the cuttings were taken. They have bloomed continuously ever since, yielding an almost incredible number of good commercial flowers. Duchesse de Brabant and Papa Gontier follow pretty closely after La France in floriferousness, but up to the present time no other kind equals La France. It is remarkable that from May to the middle of October these plants grew and bloomed without irrigation or rain. This statement seems almost incredible, even to Californians, but it is entirely true, nevertheless. The climbing sorts have made, in many instances, a growth of five and six feet. A row of Claire Carnots, another of Estella Pradels, and still another of Madame Alfred Carrières have sent up shoots the size of one's finger, and in the early part of November they were blooming quite freely. Perhaps 200 other sorts are doing equally well after the habit of each. Of course, these Roses are well cultivated, and this experience is a confirmation of my belief, often stated, that Roses will do well without irrigation on any land where an orchard will thrive, provided they have good cultivation.

I am frequently asked to name the twelve best Roses for our locality, and have made the attempt perhaps fifty times with as many different results, but in every list La France stood at the head—a place it is likely to hold for years to come. The red sport, Duchess of Albany, promises to stand pretty closely alongside the parent sort, but it seems a little weak yet from overpropagation, no doubt, and besides has by far too many imperfect flowers. A few years' propagating, by means of

strong-selected cuttings from mature wood, will, no doubt, create a greatly improved strain of this race. The same will apply to Waban, the red sport from Catherine Mermet.

Oakland, Cal.

H. G. Pratt.

New Cyripediums.

To the Editor of GARDEN AND FOREST :

Sir,—The following Cyripediums have recently flowered at the United States Nurseries, Short Hills, New Jersey :

CYRIPEDIUM LUTESCENS.—This is the result of crossing *C. Spicerianum* with *C. Javanicum*. Leaves broad, rather long, thick, pointed, light green, beautifully tessellated with dark brown, with silvery cast underneath. Flower large, well proportioned; dorsal sepal large, recurved at the base, yellowish green, with few faint lines of darker green. Lower sepal small green; petals yellowish green suffused with lilac at the ends and spotted all over with very small brown purple spots. Lip large, rather long, green, shaded with brown; staminode of a beautiful lilac color.

CYRIPEDIUM LEEANUM PULCHELLUM.—A cross between *C. insigne Nilsoni* and *C. Spicerianum*. Leaves rather narrow, growth more compact than the type. Flower large, dorsal sepal recurved, dark green at the base. Petals drooping, spotted all over with small spots and margined with yellowish green. Lip large, heavily shaded with brown; staminode of a beautiful lilac color.

CYRIPEDIUM LEEANUM LUTESCENS.—A distinct type of *C. Leeanum*, on account of its yellowish green color, derived from a yellow variety of *C. insigne*, one of its parents. Flower large, well formed; dorsal sepal yellowish green at the base, with a few faint lines of spots of a light purple. Sepals and lip of the same color, slightly shaded with brown and spotted with brown-purple.

Short Hills, N. J.

Jos. Manda, Jr.

Plant Labels.

To the Editor of GARDEN AND FOREST :

Sir,—With reference to the article in your issue of August 24th, I beg to state that the labels alluded to are manufactured by the Fabrik der Universal-Etiquetten, 5 Winkelried Platz, Bale, Switzerland. The ink is a marking ink, such as is commonly used for marking linen. These labels are neat, clean and very durable; but their great drawback is that the writing upon them must be done with ink and that they can be used but once, because this lettering cannot be effaced. Wooden labels painted white or yellow, on which one can write with a pencil, are still preferable, if they are made from wood felled in winter and seasoned for a year; but nowadays they make these from timber felled at any season of the year, and such labels are subject to fungus, which they communicate to the soil, and which is often destructive to delicate plants. Besides, wooden labels must be replaced and renewed in writing after a year or so.

I have used in the boxes where I keep my rarest plants glass labels, with good results. They are made of milky glass, which is dipped in some acid to take off the gloss and thus produce a soft surface, which is very agreeable to write upon. Characters traced with a hard pencil stand the weather well, and the labels look like porcelain, and are perfectly clean. By rubbing with emery-paper, sand and water, the writing can be perfectly effaced and the label used again. This form of label, too, has one great disadvantage—that is, a brittleness which makes it very liable to break.

What is wanted, especially for amateurs, public gardens and botanical establishments, is a label of some mineral material with a smooth surface, easy to write upon, of a pale or whitish color, which shows off the writing to best advantage; it must be possible to efface the letters somehow, and it must not be broken easily. Such a label might be made if inventors and manufacturers could only be brought to interest themselves in the matter.

Baden Baden.

Max Leichtlin.

The River Garden at Coblenz.

To the Editor of GARDEN AND FOREST :

Sir,—The article in your issue of November 23d on the Rheinanlagen at Coblenz might have said much more of the great beauty of that garden without risk of overpraise, and its value to the city cannot be too highly estimated. I remember an exceptionally hot June morning there, a few years ago, when one thoroughly appreciated the facilities which the Anlagen offered for a shady stroll or quiet reading as one sat

near the river-bank, sheltered from the glare, but just able to catch the fresher air from the water. In an average American town of the same size one would have gone, not to a garden, but to the station, in order to get away as soon as possible, and the transient population would have consisted merely of those who could not get away. It would be interesting, from a practical point of view, to estimate the gain to the business interests of Coblenz from the influence of the Anlagen in inducing strangers to stop off and not to hurry away. It would be more interesting, from a philanthropic standpoint, to estimate the gain to the physical and mental health of the Coblenzers—to their life, in the fullest sense—from this ideal utilization of a part of their river-front.

Mount Atry, Philadelphia.

Charles C. Binney.

Recent Publications.

The Beauties of Nature. By the Right Honorable Sir John Lubbock, Bart., M.P., F.R.S. New York: Macmillan & Co.

The subtitle of this volume, "The Wonders of the World We Live In," will perhaps more truly describe it than the words which appear on its cover, for the objects in the natural world which make the strongest appeal to our sense of beauty are not those chiefly discussed. There is an introduction of some forty pages, it is true, wherein the power of scenery to soothe and elevate is touched upon, and wherein we are treated to some descriptions of the quiet beauties of English landscape by Jefferies and Kingsley, while Humboldt is allowed to rhapsodize on the sublimities of a tropical night, Darwin is quoted to show the impressiveness of the boundless wastes of Patagonia, Professor Colvin writes of the chastened beauty of the scenery of Greece, and Wallace tells us how keen is the enjoyment which comes from color in sky and earth and water. But after this the reader finds little about beauty or any other single quality or phase of nature, for there is no pretense of any unity of purpose and hardly any connection of thought between the successive chapters or even between successive pages or paragraphs. It is not to be assumed from this that the book will be found uninteresting. The fifty pages devoted to plant-life treat in a pleasant way of some of the striking facts in the development of vegetation which botanical science has brought to light, and rather more space is given to the history and characteristics of a very small fraction of the two million or more species which make up the animal kingdom as it exists, not to speak of as many more that are extinct. Then we have a chapter on the Starry Heavens, with some account of the ordering of the countless hosts which wheel through infinite space. Still another chapter is devoted to the sea, with the mystery of its depths and the majesty of its swelling surface; another to the mountains and the forces which have lifted them up and are wearing them away; while yet another tells the story of the lakes and rivers, whence they took their origin and what directed their waters as they channeled their devious courses to the sea. The entire universe, with its history through unnumbered æons of astronomic time, is thus laid under contribution, and there seems no reason in any given instance why Sir John has selected one topic out of any given million, or why he has chosen to treat it in a particular way.

Of course, when astronomy, geology, botany, zoölogy and many subordinate branches of natural science find a place in a single volume, no subject can be exhaustively or comprehensively treated, but, after all, it may be said that the science is genuine. Unlike many other attempts to cast in popular form the results of learned research, the facts are stated with accuracy and clearness. Young people especially will find much in these fairly printed and attractively illustrated pages to give that pure delight which accompanies the widening of the horizon of their knowledge, and the bright boys and girls into whose hands they come cannot fail to have their attention arrested and their spirit of investigation stimulated.

Periodical Literature.

Most of our colonial towns have been made familiar to the present generation by repeated descriptions and illustrations. But, for some reason, Annapolis has not excited the same amount of attention. It is pleasant, therefore, to find, in a recent number of the quarterly *Architectural Record*, a delightful historical and descriptive account of it, written by Mr. T. Henry Randall, who was born within its verdant borders, but is now an architect of this city.

Essentially a countryman by preference, says Mr. Randall, the early colonial American of the southern states "loved

above all things the comparative solitude of a great country home. When, however, his business or profession required him to live a part of the year in some town or city, we find, as a rule, the same general plan for the house followed as in the country; and the small allowance of room for garden, surrounded by a high brick wall, is laid out with the evident purpose of making it as secluded as circumstance would permit." In Annapolis this type of house and garden was developed better than anywhere else. "On the peninsula at the mouth of the Severn River, nearly surrounded by exquisite sheets of water, the first colonists found an ideal site for a prosperous town, and between it and the Chesapeake Bay a harbor which promised to give to it the commercial supremacy of the colony. Here they laid out their town, not at random, but with a fixed idea of making the most of all the advantages that the formation of the ground possessed, circumstances which, in later years, turned the tide of prosperity away from here and left this quaint old town almost unchanged for a century as 'the finished city of America.'

"From its infancy," Mr. Randall then explains, "Annapolis had a peculiar manner of development as unlike that of her sisters as their appearance differs to-day from hers. She did not begin with hurriedly built huts, scattered over the surface, that were transformed later into comfortable dwellings and arranged with order and symmetry; but from the very first her English colonists seem to have conceived a delightful ideal in the planning of their new city. As a starting-point, in the centre of the city, and upon the greatest elevation the peninsula afforded, they set apart a circle with a radius of 528 feet, which space was to be occupied by such buildings as were necessary for the officers of His Majesty's Government. To the west of this point they reserved another circle as the site of the church. From these two centres streets were laid out, radiating in all directions, and parallel with the river, and others were carried from the shores of the harbor to the opposite side of the city."

The House of Burgesses was built in the larger circle, and, when the seat of state government was hither transferred in 1694, the first state house was erected, while the first church was built in the smaller circle in 1699. A small area was reserved on the harbor for a dock and other commercial uses; and a triangular section of the city, connecting the state house with this area, was reserved for purposes of commerce and trade. Here small, closely built hipped-roofed dwelling-houses and large store-houses were built; and here, and in another district west of the church, the tradespeople lived and worked, while outside of these restricted limits they could do neither. An open area westward of the church was, indeed, reserved as a common for their enjoyment and use; but all the rest of the city, including almost the whole of its beautiful water-frontage, was given up to the residences of the more aristocratic citizens, the land being apportioned among them by the Lord Proprietor, some receiving the whole of one of the squares formed by the intersecting streets, and others one-fourth of a square. "Only a few houses," says our author, "have to-day their original terraced gardens leading to the water and overlooking the harbor and the creek, but these few are enough to give us a clear impression of what must have been the appearance of this charming old town when, in the height of its glory (1750-1776), its entire water-front, with the exception of the wharves and dock on the harbor, was lined with stately mansions surrounded by their gardens and partly hidden among luxuriant foliage. The houses were, as a rule, placed almost directly on the streets, with the walled gardens at the sides and rear. These gardens still show traces of the skill that was devoted to them. Covered porches were few and small, and piazzas were almost unknown to the early colonists. Shade-trees and arbors answered their purpose then, for our forefathers still adhered to their English habits of life, and it was left to succeeding generations to discover that this southern climate required marked alterations in the arrangements of their homes to secure perfect comfort and convenience."

We cannot here quote Mr. Randall's many detailed descriptions of these stately Annapolis homes, which are illustrated, moreover, by a large number of excellent photographs. But the buildings and gardens are dignified and attractive. Of "Acton," the homestead of the Murrays, he writes that it still has "splendid old trees, hedges, flower-garden and lawn stretching in all directions. The flower-garden itself, as we see to-day so often in England, is separated from the lawn by high hedges running down to the water's edge from the southern side of the house, divided into beds by curiously planned walks lined with Box." Of the Harwood or Lockerman House, built in 1770, he says: "The garden at the rear falls

gradually to the east. The old Box-borders of the flower-beds have long since overgrown the walks which they once followed, and are now great hedges, indicating still the landscape-gardener's plan as it originally existed." And of the Brice House we read: "The drawing-room is unusually beautiful, and commands an outlook over the entire garden." These extracts hint at the fact that the most important rooms do not lie, as we so often find them to-day, contiguous to the entrance. The street-front of the house contains the windows of the minor living-rooms and offices, while the state drawing-rooms and dining-rooms lie at the rear, facing the gardens, with windows and doors opening sometimes on stately porticos and sometimes directly upon the lawns and commanding the beautiful water-views. There is much instruction for the modern builder of detached houses in this varied series of beautiful pictures and their accompanying text, and they leave us convinced that much more would be afforded by an actual study of the town itself. Indeed, as we finish the article, we cannot but believe the author when he says: "Annapolis may still be called 'the finished city,' and those who love her quaint old streets, her well-shaded gardens and her dark red walls of brick, can see in them something which no other city in this land affords." And, regretting that his city has been so long neglected in favor of others less worthy of attention, we are doubly grateful to him for thus bringing it to our notice. But now we wish that some adept in the art of gardening would follow in Mr. Randall's footsteps and speak as fully of the surroundings of the old homes of Annapolis as he has spoken of the houses themselves.

Notes.

Professor Budd says that sheep are not as a rule destructive to orchards, but, on the contrary, they are efficient in keeping down insects. They only eat the bark of trees when the bark is the only obtainable green thing.

A Louisiana correspondent of the *Florida Times-Union* states that *Citrus trifoliata* is very satisfactory there as a hedge-plant, making an impenetrable barrier against man and beast, and occupying less space than one of Osage Orange or the Cherokee Rose.

Among the supplies now found in New York markets are strawberries from California at \$1.75 a quart, Black Hamburg grapes from English hot-houses at \$2.50 a pound, hot-house tomatoes from Boston at \$1 a pound, new chicory from Louisiana at 20 cents a head, and fresh string beans from Florida for as much as customers can be induced to pay.

Dr. B. D. Halsted, of the Experiment Station at New Brunswick, New Jersey, is preparing a paper on diseases of the Carnation, to be read before the next meeting of the American Carnation Society, and he desires all persons who have any trouble with rusts or blights of that plant to send him affected specimens, so that he may be able to treat the subject as comprehensively as possible.

Dr. H. D. Warren, State Ornithologist of Pennsylvania, is preparing an exhibit of the fauna of that state for the Chicago Exposition. The foundation for this exhibit is the section of a mountain-side thirty-five feet long, twenty feet deep and eighteen feet high, and among the trees and undergrowth natural to an Alleghany forest-scene the birds and animals will be displayed in life-like positions and with their natural environment.

Mr. D. Nichol writes to the *Canadian Horticulturist* that the White Pine grows more rapidly on poor land in Canada than any other coniferous tree. He instances mixed plantations where White Pine trees have grown to be fifty feet high in twenty-two years, with every tree as straight as a mast, and this growth has been attained on poor land without any cultivation beyond thinning out the trees as they grew large and clearing away decayed under-branches. No other kind of forest-trees does so well when grown so closely.

Eulalia gracillima univittata is one of the most graceful of the noble hardy grasses, and its beauty and usefulness in the garden have become well known. It does not seem to have been noted that its ripening stems and leaves in autumn take on fiery brown tints, so that bold clumps of it are luminous objects in the garden till winter sets in. This coloring is peculiar to this variety, the other kinds simply fading out as they ripen. Like other *Eulalias*, this is furnished with the plumes which are the most graceful of those borne by any of the grasses.

The Massachusetts State Board of Agriculture has issued another edition of the descriptive catalogue of abandoned

farms, from which it appears that of the 339 farms originally advertised fifty-one have been sold, the owners of twenty-two others wished to have the description withdrawn, 178 owners wish the description continued, while there are eighty-eight farms from which nothing has been heard. But few of the farms disposed of have been taken for summer residences, the greater number of purchasers being Massachusetts men. The farms sold averaged 88.35 acres each, and brought altogether \$75,550, or an average of \$1,480 each.

A writer in the *Southern Stockman* says to test the ripeness of a Water Melon, the thumb-nail should be drawn over it so as to scrape off the thin green skin. If the edges of the skin on each side of the scar are left ragged and granulated, and the rind under the scar is smooth, firm, white and glossy, the melon is ripe. If the edges of the scar are smooth and even and the nail plows into the rind in places and the skin does not come off clean, then the melon is green. Two melons, one known to be ripe and the other green, should be taken and this test practiced on them until the difference is plainly observed.

After his address on orchard fruits, delivered before the Massachusetts State Board of Agriculture a fortnight ago, Mr. J. H. Hale, who is perhaps the most successful grower of peaches in New England, replied to a volley of questions from his auditors. The off-hand answers were quite as good as the address, and we add a few of them. Peaches should be fed with chemical fertilizers only. We apply every year all we can afford, that is, about 1,200 pounds of bone and from 400 to 800 pounds of muriate of potash to the acre. Too much is better than not enough. Sulphate of potash gives the best color to peaches, but cotton hull ashes is perhaps a better form of potash. Yellow-fleshed peaches have more tender fruit-buds than other kinds. We shorten in the new wood from one-third to one-half in the spring when the fruit-buds begin to swell. We can get a good peach crop with 90 per cent. of the buds winter-killed. After the fruit is set for a full crop we thin until there are no two peaches within from four to six inches of each other. This is a costly treatment, but it pays. The extras sell for six times as much per peach as the seconds do, and they do not exhaust the tree as much. The finest fruit this year came from fourteen-year-old trees. An elevated plain is not as good for a Peach orchard as a hill-side with a sharp decline. The fruit should be fully mature, but not mellow, when it is picked. Pickers are trained to judge ripeness by color. Peach-orchards should not be cultivated after the middle of July.

John Strong Newberry, professor of geology in Columbia College, died last week at Windsor, Connecticut, in his seventieth year. Professor Newberry was born in Windsor, Connecticut, in 1822 and was graduated from the Western Reserve College in 1846; then, after studying medicine at the Cleveland Medical College, he devoted two years to travel and study in Europe, and later established himself as a physician in Cleveland. In 1855 Dr. Newberry, in order to gratify his taste for science, obtained an appointment as Acting Assistant-Surgeon in the United States Army, and accompanied the expedition under Lieut. R. S. Williamson which explored the territory lying between San Francisco and the Columbia River, acting as surgeon and geologist. In 1858 he was attached in the same capacity to the expedition which, under command of Lieut. J. C. Ives, made the first exploration of the basin of the Colorado River of the west. In 1859 Dr. Newberry explored the country bordering the upper Colorado and San Juan Rivers, and during the war of secession rendered important service to the army as a member of the United States Sanitary Commission. In 1856 he was appointed professor of geology in the School of Mines, Columbia College, the position he occupied at the time of his death. Dr. Newberry's scientific publications are numerous and valuable. They were principally devoted to geology, and of late years mainly to paleontology. In 1860 he published a catalogue of the flowering plants and ferns of Ohio, but his most important contributions to botany are found in the sixth volume of the *Pacific Railroad Reports*, in which is printed his report of the plants collected on the Williamson expedition, with remarks upon the geographical botany of the region traversed, followed by a description of the forest-trees of northern California and Oregon, a paper which contains the fullest and most exact information upon these trees which has yet been published. Professor Newberry's service to botany is commemorated in *Newberrya*, a genus of leafless Ericaceous plants, dedicated to him by Torrey, which he discovered in the Cascade Mountains of Oregon.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLES: —Co-operation against Insect Invasions.....	601
The Cedar of Lebanon. (With illustration.).....	602
Notes of a Summer Journey in Europe.—XX.....	J. G. Jack. 602
On Broad Top.—II.....	Mira Lloyd Dock. 603
A Campaign against the Tent Caterpillars.....	Daniel Denison Slade. 604
NEW OR LITTLE-KNOWN PLANTS: —Galax aphylla. (With figure.).....	604
FOREIGN CORRESPONDENCE: —Centrosemas.....	W. Watson. 604
CULTURAL DEPARTMENT: —Iris and their Cultivation.—I.....	J. N. G. 606
Carnations for Market.....	T. D. H. 608
Notes from the Harvard Botanic Gardens.....	M. Barker. 609
THE FOREST: —The White Pine for Timber.....	Edmund Hersey, B. E. Fernow. 609
CORRESPONDENCE: —The Texas Barberry.....	Joseph Meehan. 611
Meehan's Halesia.....	Thomas Meehan. 611
Gardening Beside a Hot Spring.....	Charles Howard Shinn. 611
NOTES.....	612
ILLUSTRATIONS: —Galax aphylla, Fig. 103.....	605
Grove of Cedars on Mount Lebanon, Fig. 104.....	607

Co-operation against Insect Invasions.

IN an editorial article in our issue for September 28 we endeavored to show that the enormous losses every year to our fruits and farm crops, from the depredations of insects, made some concerted action necessary as a protection against these pests. No industry can endure a tax of ten per cent., and this is not an exaggerated estimate of the average loss which our farms and orchards suffer every year from this source. The loss is more than a purely commercial one, for insects and fungi not only destroy marketable products of the farm and the timber of the forest, but by ruining shade-trees and ornamental plants they deface the beauty of the garden and roadside, and in this way detract much from the comfort and pleasure of country life. In a letter referring to our article, Professor J. B. Smith, of the New Jersey Experiment Station, cited striking instances where serious loss could have been averted by timely and united work, and at the meeting of the New Jersey Horticultural Society last week he read a paper on the same subject from which we are glad to select some illustrative cases for instruction and warning.

In 1884 the Pear midge was complained of in an orchard near New Britain, Connecticut, where it had been introduced in Pear stocks imported from France a few years earlier. The insect had been growing with little observation until, in 1883, it took nearly the entire crop of the orchard. The next year, however, Professor Smith found the insect still confined to two adjacent orchards, as there were no other Pear-orchards within several miles. Dr. Riley, of the Department of Agriculture, read papers before fruit-growers' associations, warning all concerned that the insect would not remain fenced in these narrow limits, but would break out and spread over the country, and although he received votes of thanks for his "instructive address," no one attempted to arrest the ravages of the insect. Of course, the orchard of New Britain did not hold it long,

and in 1891 it had invaded the Hudson River Valley in injurious numbers, and in 1892 a neglected orchard as far away as New Brunswick, New Jersey, showed that half of the Lawrence and Bartlett Pear trees there were attacked, while a few individuals had invaded a neighboring orchard, one of the best in the state. Of course, the extinction of this insect is now impossible, and no one can tell how many thousands of dollars it will cost the pear-growers of the country to struggle with this pest in future. By co-operative action this particular invasion could have been checked at the outset, and only by co-operative action can immunity from its attacks hereafter be assured. No matter how alert and careful a fruit-grower may be, after the insect once enters a fruit, it is destroyed. He can only take measures after the injury is done to prevent a renewal of it another year. But his individual effort will be of little avail. The valuable orchard above spoken of lying near the neglected orchard, which is only a breeding-ground for the midge, furnishes a case in point. No matter what measures are adopted by the owner of the good orchard to prevent the development of the insect on his own land, there is nothing to hinder the midges from multiplying by myriads in the neglected orchard, and, when developed, hordes of them will throng over the line to attack the luscious fruit. It is the old story over again, the industrious and energetic man suffers from the lazy indifference of his thriftless neighbor.

The insect most dangerous to the Blackberry is the red-necked cane-borer, which lays its eggs at the axil of a leaf, leaving the larva to girdle the cane. In the effort of the plant to repair the injury the well-known galls are formed, and by simply cutting these out in early spring, when pruning, and burning the cut wood, the entire brood can be destroyed. But the careful grower clears his land to no purpose so long as the beetles will mature on his neighbor's canes, and then fly over to destroy his crop. Near Hammonton, New Jersey, there are many fields which are simply left to take care of themselves and every cane is infested. Such fields are simply nuisances. They will bear no fruit themselves and will produce insects to reduce the crop of all surrounding fields. Last year the crop in that vicinity was reduced twenty-five per cent. by insects alone, and next year the loss will be full one-half of the crop. It is another case where the shiftless husbandman brings ruin upon his neighbor as well as himself.

Now, it would not be difficult to draft a law which might protect a careful fruit-grower from the noxious insects bred by the recklessness of his neighbors. The difficulty at once arises that no such law will be enforced. There are similar laws against noxious weeds, but offenses against them are rarely brought into court. In California a law was passed which required the owners of Orange and Lemon-groves to use remedies which had been proved effective against the scale insect. Few persons obeyed the law, and when actions were instituted under the statute, juries of farmers could not be induced to convict the transgressors. In one of the north-western states, where swarms of Rocky Mountain locusts were devouring every green thing, it was shown that plowing over the ground where the eggs had been laid would destroy the insects and prevent injury the following year. The Legislature passed a law to make this plowing compulsory, and provided for having it done by the state where it was neglected. Still, a very small number of farmers obeyed the law, and some of them even demanded damages for trespass upon their land, when the work was done for them under state authority. It is better to enact no law than to pass one which remains a dead letter on the statute-book and thus helps to breed a contempt for all law. What is needed first in every case is an enlightened public opinion behind any given law, so that its enforcement will be ensured.

In another column of this paper will be found the instructive record of a campaign against the tent caterpillar

in a Massachusetts town. We have no doubt that there are individuals there who give no help to the enterprising societies which are fighting the insect and who make merry over the idea of a bug-bounty. And yet it is just such work as this which tells directly in helping to destroy insect pests in any given instance, and still more in showing how much can be accomplished by united labor for in this way public sentiment can be generated and developed into an efficient force behind future legislation. It is a very difficult thing to unite all the members of a community in any systematic action, even when the necessity is at their very door. It is almost impossible to secure the co-operation of land-owners throughout a state to prevent an evil which they do not see, and which they, therefore, do not dread. But, after all, union for protection is the only practicable way to meet these enemies. This is the first necessity, even if the best of laws are enacted.

The Cedar of Lebanon.

THE Cedar of Lebanon has stood for generations throughout Christendom as the type of all that is majestic and regal in a forest-tree. It has in modern times been questioned whether the timber with which Solomon rebuilt the Temple was that of the true Cedar, but, however this may be, the trees are always associated in the popular mind with stately religious ceremony, and the groves of Lebanon have been objects of veneration by pious pilgrims for centuries. The position which the tree holds in Christian literature is well exemplified by the following passage from the *Spirit of the Hebrew Poetry*, by Isaac Taylor, who, in describing the Lebanon ranges and their trees, says: "In ancient times these rich slopes and valleys were mantled with Cedar-forests, and the Cedar, in its perfection, is as the lion among the beasts and the eagle among the birds. This majestic tree, compared with others of its class, has more of altitude and volume than any of them, it has more of umbrageous amplitude; especially it has that tranquil aspect of venerable continuance through centuries which so greatly recommends natural objects to speculative and imaginative tastes. The Cedar of Lebanon, graceful and serviceable while it lives, has the merit of preparing in its solids a perfume which commends it when dead to the noblest uses. This wood invites the workman's tool for every ingenious device, and its odoriferous substance is such as to make it grateful alike in palaces and in temples." As a matter of fact, it would be difficult to exaggerate the impressiveness of this tree, even if it were not dignified and almost hallowed by association. In vol. ii., page 148, we have already given a figure of one of the old trees on Mount Lebanon, and in the same issue is an illustration of a pair of wide-branching old specimens, such as are to be found in many of the stately pleasure-grounds of England, where this Cedar has been more generally planted for the last two hundred years than any other foreign tree. In connection with the pictures, some account was given of the remnants of the Lebanon forest, as described by Sir Joseph Hooker, and the illustration on page 607 shows one of the nine groups which remain in one of those elevated valleys. Only 400 of the trees survived at the time of Sir Joseph's visit, and unless the seedlings are protected from fire and from sheep and goats, these particular forests will, in course of time, become extinct. The largest trees remaining are some forty feet in girth, and the smallest ones are eighteen inches. Other groups of this Cedar have been discovered since the visit of Sir Joseph Hooker, and, in fact, *Cedrus Atlantica*, which is found in Algeria and Cyprus, and *Cedrus Deodara* of the Himalayas differ very little in botanical characters from the true *C. Libani*, although they are quite distinct in appearance at all stages of their growth. For some unknown reason the Cedar of Lebanon has never been a favorite with American planters, although it is hardy in the latitude of New York, and the few specimens here which have attained the age of fifty years and upward are noble trees.

Notes of a Summer Journey in Europe.—XX.

THE late reconstruction and rearrangement of a large portion of the Arboretum at Kew is likely to give the idea of comparative newness, but there are old trees enough to impress one with a feeling that the establishment has reached a venerable age. For the most part, the specimens, both young and old, are in a vigorous condition; and, it is hardly necessary to add, the correctness of the labeling can be more safely trusted here than in many of the institutions on the Continent. A notice of a few of the specimens and groups may give a faint idea of the collections as a whole. The Oaks may be counted as forming one of the largest generic groups, being represented here by over two hundred species and named varieties. Of the so-called varieties fifty or sixty are forms of the two English or European Oaks, *Quercus Robur* (also known as *Q. sessiliflora*) and *Q. pedunculata*, by far the largest number of these forms being referable to the latter species. *Q. pedunculata* itself is still classed as a natural variety *Q. Robur* by many botanists. Of course, most of these fifty or sixty named forms have originated by selection and long cultivation, and can only be propagated by grafting or other modes of division.

There is a good series of the more hardy American Oaks, by far the best specimens being those which come under the black or biennial fruited section of the genus. The American White Oaks, both in England and on the Continent, for some unexplained reason, do not seem to thrive as they do in their native country. One of the finest examples of the American species is a specimen of the Willow Oak (*Quercus Phellos*), with a trunk over three feet in diameter, and a spread of branches of at least sixty-five feet. This specimen has apparently reached its best development, for a fungus is beginning to show itself in places in the bark. Our Scarlet, Black, Red, Pin (*Q. palustris*) and Laurel (*Q. imbricaria*) Oaks all thrive well here, and some of them are said to show fine autumn colors of foliage.

Of other exotic species the Turkey Oak (*Q. cerris*) and its forms seem admirably suited to the soil and situation at Kew, the branches of the largest specimen seen here spreading about a hundred feet, the trunk being fifteen or sixteen feet in circumference; while *Q. conferta*, a native of south-eastern Europe, impressed me as being one of the handsomest and most satisfactory of all the species in the collection. A specimen here which gave evidence of very fast growth had a broadly conical outline, large and abundant foliage and a trunk about twenty inches in diameter. The oaks, as well as most of the other trees, appear to be pretty accurately named on the whole, and show the active care and interest taken in them by Mr. Nicholson. The nomenclature of the Lindens, however, is sometimes puzzling, as it is in most collections.

Among other deciduous trees notable for their age or size, examples of *Sophora Japonica* are likely to attract attention, especially when they are in blossom. One of the largest of these is about fifty feet in height and thirteen or fourteen feet in circumference of trunk. At a few feet from the ground it divides into several very large limbs, which, at about twenty or thirty feet from the ground, are held from breaking or unduly spreading by strong iron chains and encircling iron rings. I was surprised to see this system of supporting weak limbs in practice at Kew, for the iron rings, having been on for many years, were deeply embedded in the bark and wood, and the limbs were evidently slowly and surely being choked to death, and the beginning of the end was shown in large dead branches which workmen were removing. A bolt fitted with a ring or eye at the head, to which to fasten connecting chains or rods, and put through a hole bored in the limb just large enough, is much to be preferred to a ring around it, even though it may be quite loose. The new bark and wood tissue will soon close up the entire space about the bolt, and so prevent the ingress of fungi or other diseases, and the small hole necessary for the reception of the bolt does not materially weaken the limb, certainly not nearly so much so as a band or girdle does after it begins to cause a constriction of the part under it. This ring or band system is very commonly used, and it is often pitiable to see the poor trees endeavoring to overcome the obstruction to the free circulation of its sap by swelling and extending its tissues over the unyielding girdle.

A tree which attracted my attention was an unusually fine specimen of a Hop Hornbeam fifty feet in height, branching near the ground and spreading about seventy feet, and with a trunk over three feet in diameter. It is labeled *Ostrya carpinifolia*, a native of south-eastern Europe. This specimen is grafted on stock of a Hornbeam (*Carpinus*) at about two and a half feet above the ground, and it is a good deal larger than its stock, and has a swelling at the point of juncture. No one can

help remarking the striking contrast between the rough bark of the *Ostrya* and the dark-colored, comparatively smooth bark of the *Carpinus*. Other such interesting trees are not rare here, but many or most of them are equalled or surpassed as specimens by examples in gardens in various parts of the kingdom.

The collection of hardy conifers is quite large and varied as regards numbers of species, and it possesses a good deal of interest to the specialist in this division of dendrology. But while such species as the *Gingko* seem to thrive very well, the evergreen conifers must suffer from the great volumes of smoke which sometimes settle over the gardens. This smoke not only proves a great handicap to the production of good conifers, but also operates against other evergreens of the Angiospermous class, and it is a source of great annoyance by sometimes settling and covering the great glass-houses with a thick black dust, which is so persistent and adhesive that it is necessary to wash the glass carefully after some especially severe visitations. If in summer the old leaves of an evergreen plant are rubbed, the persistent black dust will readily come off on the fingers. The proximity of factories and of a great city where soft coal is used is thus a serious drawback to the successful growth of a great variety of evergreens, and as it does not seem likely that this can be ameliorated at Kew such trees as most evergreen conifers will always find this an obstacle in the way of their highest development. This does not mean that such conifers cannot be grown here, for they can be, and are, and the collection at Kew is both large in number of species and interesting in regard to the size which some of the specimens have attained, although, perhaps, few of them are so large as most people would expect to see them.

Possibly it is on account of their being in the midst of this seething multitude, with its gases and coal-smoke, that the Big Trees, or *Sequoia gigantea*, introduced from the California groves, appear to be degenerating after a good many years of active and promising growth, and after attaining proportions of a fair-sized tree. At first the *Sequoia* has a fine symmetrical form, but after it attains a height of thirty or forty feet it is liable to become ugly by the loss of branches and a general straggly appearance. Although there may be peculiarly favorable spots in England where the trees may enjoy a life of many centuries and become of large size, their chances for any such development near London seem very slender; and this can hardly be wondered at if we but compare the atmosphere in which the foliage is often placed now with the high pure air which was its element for centuries in its aboriginal surroundings. This is one of our American trees which, although it can be grown in Old England, will not thrive out-of-doors in our cold New England climate. It is gratifying to know that the common name of *Wellingtonia*, which this noble tree early received in England, seems to be giving way to its proper title—*Sequoia*. A so-called "weeping" form of this tree is now in cultivation in some foreign nurseries.

The Pines here generally appear quite healthy, and there are some very fair examples of several of our American species. Among these are *Pinus Coulteri*, over twenty feet high and bearing cones; *P. contorta*, twenty-five or thirty feet high and also fruiting freely; the dwarf Gray or Jack Pine (*P. Banksiana*), of our far north and north-west, looking healthy, but as straggly as on its native soil; and an example about nine feet high of the odd so-called One-leaved Pine (*P. monophylla*) with its leaves both single and in pairs. In another portion of the garden there is a specimen of *Pinus Sabiniana* with a trunk nearly two feet in diameter and a much larger and handsomer example of the Corsican Pine.

The North American Spruces show much variability between species as to their adaptability to the situation here, and the Himalayan *Picea Morinda* seems to thrive much better than some of them. This is a species which is not adapted to our New England climate, but it is a desirable tree, having long leaves and long slender branchlets, with the drooping habit of the Norway Spruce. Some of the Hemlocks seem pretty thrifty, but the Junipers are not very satisfactory although some dwarf species seem to do better than others.

Most visitors are interested in the specimen of Chili Pine, or "Monkey Puzzle" (*Araucaria imbricata*), grown in the open air here, but only known to us when brought under warm shelter in winter. This oldest specimen at Kew was planted in 1796, so that it is very nearly a hundred years old; but it has not attained the size of younger plants in other places. It was one of the first plants introduced, and for many years after its reception at Kew it was grown in a greenhouse as we would a Palm. It was, afterward planted in the open ground, but protected in winter, until it was demonstrated that it was quite hardy in the English climate. It is now only about thirty-five feet high, with a trunk fifteen or sixteen inches in diameter.

The Japanese *Gingko* is here a thrifty tree, as it appears to be in most places where it has been tried. It is likely to become much more popular, but we do not yet know how it will bear old age in this country.

Arnold Arboretum.

J. G. Jack.

On Broad Top.—II.

BROAD TOP was beautiful this autumn in an unusual way. The passing of summer was so gradual that at one time it seemed as if winter would find the Maples still green, and a flurry of snow on the 5th of October found them but slightly tinted. They seemed to be eclipsed by the wonderful tones of color shown by the Tupelos, Oaks and Hickories; but the snow turned to rain, and after two days of that, when the curtain of mist rolled away, the Maples suddenly appeared in their old-time splendor.

For the first time in our recollection some of the streams and springs became dry, but, in spite of this, the Ferns and water-loving plants were never more fresh and fine. The Cardinal-flowers seemed unable to end their brilliant life, the *Chelones* were crowded with blossoms, and the closed *Gentians* were remarkably numerous and beautiful.

Before the mountain itself showed more than faint touches of color there was a short-lived, but brilliant, display made by a forest-surrounded meadow lying at the lower extremity of this little farm, now our temporary home. The farm, and most of the surrounding mountain, forms part of a 12,000-acre tract belonging to one of the coal and iron companies, and as all the most beautiful country here is in the possession of corporations, no private holdings are possible.

While this farm by no means belongs to the class of "abandoned farms," the fields lying between the house and meadow are object-lessons in the relapse from cultivation to original conditions. Passing down through the fields, we find the uppermost one, which always is in fairly good cultivation, in Clover. The adjoining field has the same starved, slaty soil as the next below, and the two are separated by a fence overgrown with vines and shrubbery. Only a small portion of both is in cultivation, now planted with Corn, Potatoes and Buckwheat; the rest of the thin soil shows a faded growth of Golden-rod. A tree-bordered fence runs along the lower side, and beyond it lies the largest field of all, once like the others, with infinite labor cleared from out of the forest. Now the sparse grass on its sloping surface is covered with a mat of Creeping Blackberry, Asters and Golden-rod, and in the field-corners are thickets of young Maple, Hickory, Yellow Pine, Cucumber and Locust trees.

The meadow which is our destination, though close by, is not visible, as its fence is concealed by a dense growth of Oak, Sassafras and Witch-hazel. Midway in this hedge, a broken panel of fence gives access to the meadow, and from this gateway, framed by two Oaks, the whole scene, an enchanting harmony of color, is before us. The meadow, almost circular in form, is an expanse of silver-green marsh-grass, forming the foreground for brilliant masses of shrubbery, thrown into relief by White Pines on the edge of the forest beyond. In the near foreground lie a couple of crumbling Chestnut-trunks, almost buried in bracken; beyond them is a most effective little island of sedge, and the entire meadow floor is thickly dotted with such quantities of *Spiranthes cornua* as I have never found elsewhere. The shrubbery crowding every little point of dry land which projects into the marshy grass gives a distinctive character to the place. Almost every species found on the mountain is represented here; most notable for form and coloring are the wild Crab-apple and Thorns. Between the shrubbery and encroaching forest lies a crowded mass of plants, interesting now, but infinitely more so in the spring.

In a cursory examination of a space about ten feet square, I noted closed *Gentian*, Golden-rod, wild Parsnip, Wintergreen, *Arbutus*, three varieties of Ferns, several of Grasses, two each of *Lycopodium* and Cinquefoil, and seven Mosses. Fascinating as is the meadow, it is only one of scores of places equally interesting and beautiful. Of two paths from the meadow, one leading through the woods presents a greater variety than the other, following a wagon-way which crosses between two township roads. We enter the path where it runs close beside a little brook, here curving around some Beeches, the only ones to be found in this part of the mountain. A short distance beyond, four majestic White Oaks, growing equidistant about twenty feet, dwarf everything near them. Through almost the entire length of the path the stream is in sight, sometimes screened by the waving fronds of superb *Osmundas*, at other times hidden by the Ironwoods, whose delicate foliage in certain

atmospheric conditions appears like a green mist. Aspidiums and Maiden-hair Ferns border our path, the sunshine wavers across the Spice-bushes and against the trunks of some fine Maples, which give their name to this "Sugar-camp Path."

Half-hidden by Ferns, and Spikenard with its graceful racemes of crimson-purple berries, we see the old troughs at the base of the trees. One moment we are apparently in the depth of a forest, the next we have passed between Alders into a sunny lane, between the upper Clover-field and the "Spring-house Meadow." This meadow is a complete contrast to the one we have just left, for here the grass shows only a few pale Violets and *Spiranthes* instead of the crowded life below; but long after the lower field has faded into monotonous gray this little sheltered spot remains green, and is a most beautiful setting for the home-acre.

Harrisburg, Pa.

Mira Lloyd Dock.

A Campaign against the Tent Caterpillars.

DURING the last few years the road-sides in the vicinity of Boston, as also in other portions of the state, have been infested in the month of May by hordes of Tent Caterpillars. In some districts rural beauty has been seriously impaired by them, and the ravages of these insects have become an insupportable nuisance. Making their appearance at the season when the leaves of the Apple and Cherry are just unfolding and when the fresh spring foliage is everywhere at its best, the destruction caused by them is painful and depressing to behold. Entire trees and shrubs are completely stripped of their leaves, while myriads of their unsightly nests are left to dangle from the bare branches. To the lover of natural beauty words can hardly depict the appearance which an infected region offers; nor is the sight less revolting which is presented by the remains of the worms crushed under the foot of man and beast, as they crawl in thousands even to the upper rooms of dwelling-houses in search of proper shelter for weaving their cocoons.

In the course of the past year the Newton Horticultural Society had its attention called to this subject by several members, and steps were taken to arrest, or, at least, to mitigate, the evil. A circular was issued giving an excellent plate, illustrating the various stages of the development of the insect, and offering various prizes for its destruction as well as the following information: "The moth lays its eggs on the small twigs of various trees and shrubs, mostly of the Apple and Wild Cherry, in the form of a belt, which encircles the twig. This belt of eggs is covered by the moth with a brown mucilaginous substance, which serves to fasten it firmly in its position, while it protects it from the weather and from other injuries. The belt should be removed from the tree by cutting or breaking the twig upon which it rests, and preserved in a cool place. It will be necessary to present these for examination in competition for the prizes to one or more of the committee whose names are signed to the circular."

In this good work the Horticultural Society had the co-operation of the Newton Centre Improvement Association. As a result, \$75.00 were distributed in prizes and gratuities among the competitors, the first prize of \$15.00 being given to a young lad who presented over 14,000 belts. The gratuities bestowed were for the purpose of inciting future interest in this direction, and were from the private purse of a generous citizen.

In order that the work may be carried forward systematically next year, a circular has been prepared and sent to the citizens of Newton, in which it is stated that probably 25,000,000 eggs of the tent caterpillar were destroyed last year, and that, in order to stimulate the efforts of the boys and girls of Newton, it is proposed to offer \$1.00 for every lot of 1,000 belts. As this will require funds, contributions are invited. The circular also invites the attention of landholders to the fact that worthless trees and shrubs growing on their premises, especially Apples and Wild Cherries, should be cut down, as they are favorite breeding-places for numerous pests. In addition to this circular an advertisement was placed in the local papers, announcing that the Newton Horticultural Society would pay a bounty for every lot of 1,000 belts of eggs of tent caterpillars received before the first of April. It may be added that it is eminently wise to prepare for the work at an early date, so that collections can be made during the winter and spring months.

It is to be hoped that the praiseworthy example of the Newton Horticultural Society may be followed by the adoption of similar or better plans, if possible, by all towns and villages for the extermination of this pest. It would seem, from experience, that the most feasible method of destruction is by collecting and burning the belts of eggs before the period of hatching, which varies with the season, being in this latitude

from the middle to the last of April. After the nests are formed, the work becomes one of much greater magnitude and much less satisfactory.

Chestnut Hill, Mass.

Daniel Denison Slade.

New or Little-known Plants.

Galax *aphylla*.

THIS is a handsome and interesting plant. It is interesting as the representative of a monotypic genus of a small although very widely scattered family (*Diapensiaceæ*), which is represented in the flora of eastern North America by the beautiful Pixie-flower, *Pixydanthera*, of the sandy Pine-barrens of southern New Jersey and North Carolina, by another monotypic genus, by *Shortia*, of which a figure and description will be found in these columns (vol. i., p. 509), whose only relative is in Japan, and by *Diapensia*, with a single northern species which extends to Greenland and then eastward to Japan.

Galax (see page 605) is a glabrous herb with red creeping and matted root-stalks, which send up round-cordate thickly crenate-dentate veiny thin leaves, which are persistent through the winter, an inch and a half to two inches across and long-stalked. The single flower-scape is slender, sometimes two feet tall, almost destitute of bracts, and terminated by a virgate spicate raceme of many small white flowers. These are composed of a five-parted minutely two-bracteolate calyx, a corolla composed of five entire oblong petals, which are distinct except where their bases are adnate with the base of the monadelphous stamen-tube, which is ten-lobed above, the lobes alternate with the petals, being short and bearing sessile introrse anthers, while those opposite the petals, which are really staminodia, are larger, linear-spathulate and petal-like. The style is very short, and is crowned by a slightly three-lobed stigma. The fruit is an ovate capsule filled with angular seeds.

Galax is a common plant in the region of the southern Alleghany Mountains, from Virginia to Georgia. At elevations of three or four thousand feet it often covers the ground under Hemlock-trees and other evergreens with great carpets of its beautiful shining leaves, and when the plants are in flower the appearance of this undergrowth is specially beautiful and attractive.

Galax has a bad name with cultivators, and it is rarely seen in good condition beyond the borders of its native home. It was introduced, however, into English gardens as early as 1756; and that it can be cultivated if proper attention is paid to its wants is proved by the great mass of plants in perfect health and beauty which for at least fifty years have been growing and extending in the Knap Hill Nursery in England, where four generations of Waterers have been cultivating and improving American plants.

Of late years great quantities of handsome circular lustrous leaves of a dark vinous color have appeared every winter in the shops of florists in this and other northern cities, and numerous inquiries are addressed to us every year as to the name of the plant which produces these leaves and the source of the supply. They are leaves of *Galax* gathered among the mountains of Virginia and Carolina and sent north for winter decoration, for which purpose their size, shape and color well fit them.

Foreign Correspondence.

Centrosemas.

IHAVE received inquiries from several American correspondents, and also from friends in England, with respect to the merits of the *Centrosemas*, and particularly of *C. grandiflora*, as garden-plants. We have two species in cultivation at Kew—namely, *C. Plumieri*, an old introduction, generally known, I believe, as a *Clitorea*, and *C.*

Virginianum, which was introduced from the West Indies last year as "a new and beautiful species of Clitoria."

Of the other twenty-four species of *Centrosema* known to botanists, none, so far as I can ascertain, have ever been

The genus is almost entirely American, chiefly Brazilian. It is a near ally of *Clitoria*, of which genus *C. ternata*, a stove-climber, with large pea-shaped deep blue flowers, is a well-known garden-plant. All the species are more or

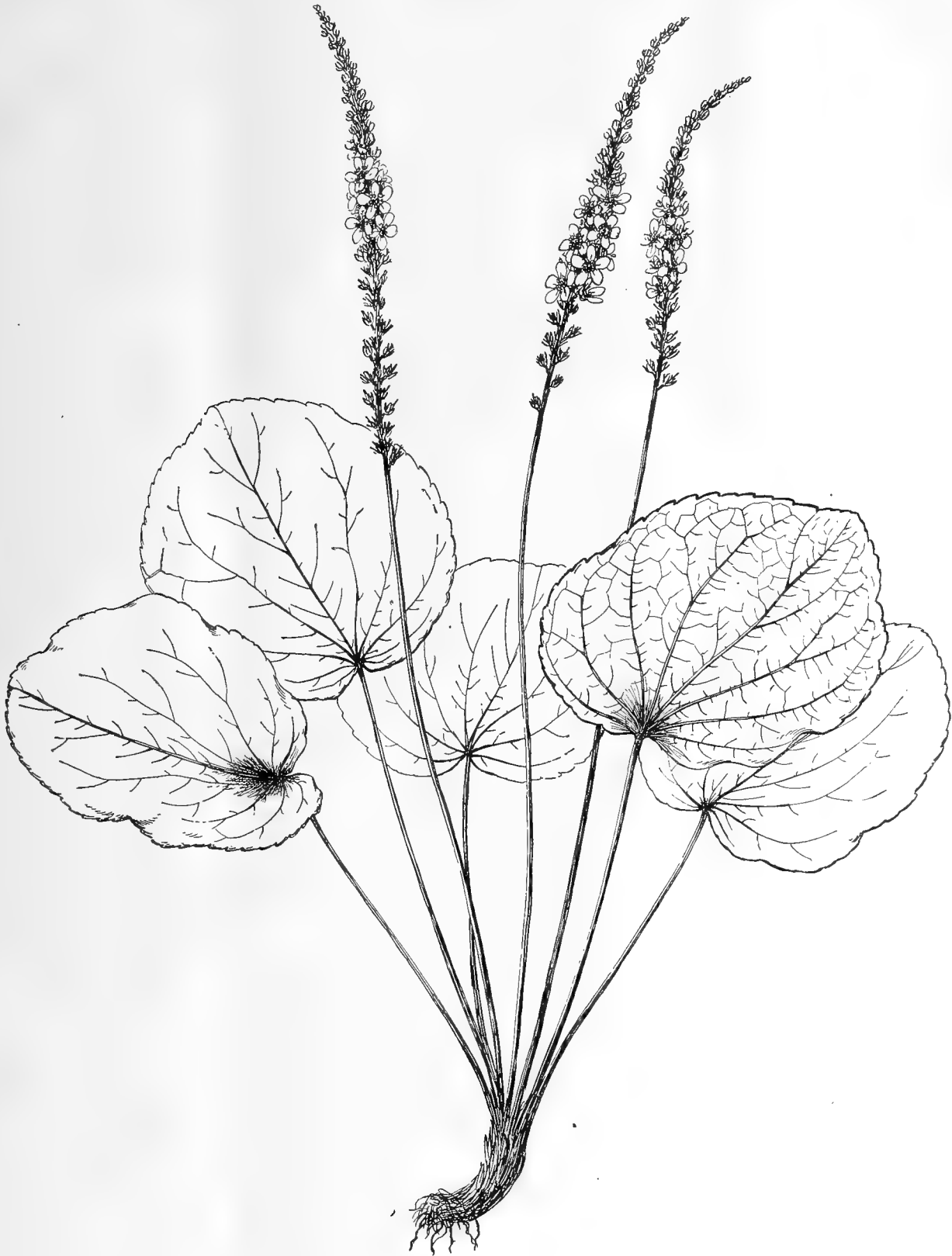


Fig. 103.—*Galax aphylla*.—See page 604.

cultivated here as garden-plants. Judged by dried specimens in the herbarium, by pictures and the descriptions of botanists and collectors, a considerable proportion of these plants are deserving of the attention of gardeners.

less climbers, some of them twining like a Scarlet-runner, others being of less rambling habit. The leaves are generally trifoliate, the leaflets *Phaseolus*-like, except in one or two species, in which two of the leaflets are entirely sup-

pressed. The flowers are papilionaceous, and are remarkable for the large size of the vexillum, or standard, which in some of the species measures fully two inches across. They vary in color from white to rose, violet and blue, and generally they are prettily lined or shaded with other colors. They appear to fruit as freely as the Kidney Bean, the pods generally being long, narrow and four-angled. *C. Virginianum* has produced a very large crop of good seeds with us this year. The pods of some of the species are eaten as we eat beans. The two species under cultivation here are stove-climbers; at any rate, we find they thrive perfectly in a stove. Possibly, however, *C. Virginianum*, which is, I perceive, a native of the southern United States, may be successfully grown in an ordinary greenhouse temperature, or even out-of-doors in summer. It may be as hardy as the Sweet Pea, although the species are most abundant in tropical regions.

The following species appear to be worth introducing for trial in the garden:

Centrosema platycarpum. This has exceptionally large broad pods and large purple flowers. Kalbreyer, who collected it in Ocana, describes it as a "papilionaceous twining half shrub, eight to ten feet high, with large single deep purple flowers and large trifoliolate leaves." It is also found in Brazil and British Guiana.

Centrosema coriaceum has small Willow-like leaflets, and forms a suffruticose procumbent shrub with large blue flowers. It is Brazilian.

Centrosema vexillatum has ovate leaflets three inches long, and beautiful flowers two inches across. Schomburgk, who collected it in Guiana, called it a herbaceous twiner with large flowers, colored white, with blue streaks, and a purple disk.

Centrosema Brasilianum is another stout climbing shrub with large flowers of varying shades from lilac to blue and violet, some having stripes of yellow through the standard. It is, or was, common in Trinidad.

Centrosema macrocarpum has large edible pods and white flowers, striped with blue. It is a native of Guiana, etc.

Centrosema pubescens is another large handsome-flowered species which Linden found in New Granada, and Kalbreyer in Ocana at an elevation of 4,000 feet.

Centrosema Plumieri is a coarse climber, with large kidney bean-like leaves borne on stout, twining stems. The peduncles are axillary, and each one bears five or more purple and white flowers, one and a half inches across. It was introduced from the West Indies by Dean Herbert, and flowered in his hot-house in October, in 1837. Lindley figured it in his *Botanical Register* as *Clitoria Plumieri*. It is common in Brazil.

Centrosema Virginianum was in cultivation in England over sixty years ago, but it does not appear to have become popular. It was introduced to Kew last year, where it flowered most profusely in the tropical Water-lily house, its thin twining stems running along the roof for about two feet, and flowering from every leaf-axil. The peduncles are short, and they bear two or three flowers each, the flowers being one and a half inches across, pale lilac lined with purple. The pods are very narrow, and about six inches in length. Treated as a stove-annual, and grown in pots, with the stems trained about a light trellis, this plant would be decidedly attractive. According to Lindley, who figured it as *Clitoria Virginiana*, it grows on hedges in Virginia and Carolina, also in Jamaica and San Domingo. It varies in the size of its leaves, and some of the flowers are white, others lilac.

Centrosema grandiflorum. This is described by Bentham in *Martius' Flora Brasiliensis* as a climbing shrub, with thin glabrous stems and trifoliolate leaves, the leaflets from two to four inches long by one to two inches wide, smooth above, velutinous below. Peduncles axillary, short, bearing from three to seven flowers, in which the vexillum is one and a half inches in diameter, and silky. The pod is six inches long and glabrous. The plant is wild in Central Brazil and in Caldas in Minas Geraes.

This species, or what is supposed to be this, has been described by one who has it in cultivation as "a perfectly hardy climbing plant, of rare and exquisite beauty, which flowers early in June from seeds sown in April, and bears in the greatest profusion inverted pea-shaped flowers from one and a half to two and a half inches in diameter, varying in color from a rosy violet to a reddish purple, with a broad-feathered white marking through the centre. The large buds and the back of the flowers are pure white. Sometimes six or eight flowers are produced in a single cluster. It is well adapted for every garden, especially as a climber, running six to eight feet in a season. Even in the poorest soil it will bloom freely until cut down by frost." This description might easily be mistaken for that of one of Mr. Eckford's latest Sweet Peas!

NEW CHINESE LILIES.—The genus *Lilium* promises to be exceptionally well represented in China, the number of species now known from that country being twenty-four.* Monsieur Franchet, of the Paris Herbarium, has recently published in the *Journal de Botanique* a classified list of all the species of *Lilium* now known in China and Thibet, prepared from the collections made in those countries by Monsieur Delavay and others, including Dr. Henry. Mr. Baker has made a brief abstract of this paper for the *Gardeners' Chronicle*, adding a few words about each of the new species. Of these there are twelve, and some of them are evidently very beautiful. Thus *L. formosum* has white broadly campanulate flowers six to seven inches long; *L. Delavayi* has flowers like those of *L. candidum* in form, and colored wine-red, with brown spots; *L. ochraceum* has flowers of the Martagon type, colored yellow, unspotted, with oblong segments; *L. myriophyllum* has very numerous leaves and erect, white, large, cup-like flowers; and so on. It is to be hoped that the French collectors have sent home seeds or bulbs of these plants in addition to the dried specimens. The distinct, beautiful, hardy *L. Henryi*, which, by the way, is omitted from Mr. Baker's list, was introduced in this way from China to Kew by Dr. Henry. Collectors of plants for herbaria should always obtain as far as they can seeds or living material of some kind of all interesting plants for cultivation. If these new *Liliums* are as hardy and free-growing as those species which are already established favorites in the garden, they will be a very valuable addition to cultivated plants. We have nothing much better than *L. speciosum*, *L. longiflorum*, *L. tigrinum* and *L. giganteum*, and these are of Chinese origin. Mr. Baker says: "The collections that have been made lately in western China and Thibet have shown that these regions are exceedingly rich in new types, belonging to many of our favorite garden genera." Here is a useful hint for collectors.

London.

W. Watson.

Cultural Department.

Irises and their Cultivation.—I.

THE publication of Mr. James Baker's *Manual of the Iridæ*, as announced lately in GARDEN AND FOREST, is sure to be welcomed by every owner of a garden, where hardy plants are valued and studied. There is no other important family of plants about which reliable information has been more difficult to obtain by persons who do not have access to botanic gardens. The publication of this book from such an authoritative source is sure to give a new impulse, not only to the collection and cultivation of the Irises, but, it is also to be hoped, of the less known species of *Gladiolus*, which seem to have mostly disappeared from cultivation. It will be a comfort to have a manual, to which one can turn with confidence in the effort to determine the true species, and discover synonyms, not always a simple matter to one with little botanical knowledge. If plants are to be labeled, it is a matter of the first importance that they shall be labeled correctly, and for this we must depend on the acumen of the scientific botanist. In a horticultural way, of course, we are compelled to make certain compromises with scientific knowledge when the distinctions, botanically, seem closely drawn. *Moræas*, for instance,

* Twenty-five with *Lilium Henryi*.



Fig. 104.—Grove of Cedars on Mount Lebanon.—See page 602.

which are still relegated to a separate genus, will probably, in a garden, be always counted as Irises. An ordinary observer would not see any difference, and it would embarrass the average grower to attempt to explain their distinctions. Counting the *Moræas*, we have, it seems, something over two hundred distinct species of Irises recognized at present, to which, probably, we shall constantly receive accessions. These, with the numerous varieties and hybrids, offer, certainly, a most extended and interesting field to the gardener and student.

As was said editorially a few weeks since, the Irises have ever been the favorite plants of the hardy garden. Though seldom grown in large variety in the average garden, few gardens are without one or more kinds. Next to the double yellow *Narcissus*, there is probably no plant more widely disseminated in gardens through the country than the common *Fleur de Lis*. In the older sections of our country, at least, *Narcissus telamonius plenus*, *Iris Germanica* and *Lilium candidum* are a trio, all, or one or more of which, may be found in most old gardens. Besides the *Iris* mentioned, there are few varieties to be found in country gardens in this section. At least, a flower-loving friend, with a fancy for Irises, has searched this country-side very thoroughly to add to his collection, and has discovered less than a dozen, and these mostly hybrids, or the so-called German Irises. As some other sections of the country may possibly have the same dearth of these plants, it has occurred to me that a few notes on the family may be helpful and suggestive to others, for among the species and varieties are many very interesting plants, second to no others in beauty and garden value, and plants, too, for the greenhouse, the cold-house and the hardy garden.

The species embrace a great range, and it is impossible to give general directions for their culture, for, while some species are very difficult subjects to flower, many kinds are very easily grown, increase very rapidly, and are thoroughly reliable and satisfactory garden-plants. The bulbous kinds mostly are better for an occasional replanting, though among these there are a few which seemingly take a very short rest, and should not be kept out of the ground many weeks. The other sections resent removal, and are somewhat slow to establish thoroughly. They mostly have good, strong, long roots, and appreciate a good deep soil, not too heavy. It is usually a gain to plant these in the early fall to give them a chance for the following season. While some kinds, such as our common *I. versicolor*, are often found growing as aquatics in a foot or more of water, they do equally well in a dry border. While a fair amount of moisture, not stagnant, is appreciated by most of these Irises, care should be especially taken to plant those whose rhizomes creep at the surface, so that water can freely flow from them. Apparently the only *Iris* whose flowers are susceptible to increase in size by cultivation is *I. lævigata*, forms of which, known as *I. Kämpferi*, the Japanese have supplied to us. These, while growing vigorously in a dry border, respond to liberal treatment in the way of water and stimulants by giving increased size of flowers. Some of the rhizomatous Irises are said to do well as pot-plants if the roots are crowded, but the few tried by me have as yet failed to flower. *I. Tectorum* (the Roof *Iris* of the Japanese), for instance, the leaves of which are very graceful, has failed to flower after two years of closely potted life.

Elizabeth, N. J.

J. N. G.

Carnations for Market.

THE Carnation in America has become a distinct type. In a literal sense it is a product of the soil. The home-raisers have the field, and the market, too. No foreign importations approach the standard now attained here. A variety to hold its own must be a true Perpetual, of free, low-growing habit, with grassy foliage, allowing the free access of light and air. It must have good stiff flowering stems, with productiveness and good shipping qualities are essential. Owing to the demands of the market, selection during recent years has been in the direction of longer stems. Where a stem produces a number of buds the flowers are small by comparison, unless disbudding is practiced, and growers seldom have the time or inclination to do this. Even with the best varieties, enough short-stemmed buds are produced to meet all the demands of the market for button-hole and bouquet work, and more than this is a dead loss. Another important qualification of a new variety should be a tendency to produce after the first crop an unusually large proportion of single buds. This has always been a good quality of *Grace Wilder*, and, perhaps, explains why it has remained so long in the front rank among pink Carnations. The same is true of Mrs. Fisher among white varie-

ties, since in this respect it is superior to *Lizzie McGowan*. A good crimson like *Anna Webb* or *Ferdinand Mangold*, with these qualifications, would be a treasure indeed.

Carnation-growers are springing up everywhere, and when it is considered that the outlay for establishing a business in this direction is comparatively light, there is some fear among the older growers that the market will be overstocked. One certain result will be to increase the average quality of the flowers. For first-class blooms there always has been a good market, and the indications are there will continue to be.

To the question, Which is the best white variety for market? growers hereabout unanimously answer Mrs. Fisher. It is a true Perpetual, a heavy and continuous cropper and an excellent shipper. It bears a good-sized, round, full double and sweet-scented flower. During a recent visit to Mr. Nickolson's, of Framingham, I saw part of a lot of 500 plants struck last January, and planted outdoors May 20th, which yielded between the 15th of July and the 20th of September an average of 1,500 flowers per week. These same plants were at the time of my visit (December 5th) blooming in very good form, and there was no apparent difference between them and the remainder of the lot, which were struck later and not allowed to bloom, except that the plants were slightly taller. The argument that certain varieties have a local adaptation seems to hold good in the case of this variety, which is scarcely grown outside the limits of the Boston trade, and has been contemptuously dubbed by the New York and Philadelphia growers the Boston White. Mr. James Tulis, grower for Mr. Homer Rogers, of South Sudbury, has four large houses devoted to it exclusively. The practice adopted here of growing each variety separately has much to commend it. The particular needs of each can be better studied and attended to.

Lizzie McGowan, the popular New York and Philadelphia white, is finding some favor. Its constitution is good, its habit perfect; the stems are stiff, with fine grassy foliage, which admits light and air freely, an essential quality in a winter-bloomer. Its principal defects are lack of substance, and, consequently, poor shipping qualities, and, moreover, it is only slightly fragrant. *Silver Spray* stands well in comparison with other market varieties; it is a fair shipper and a good keeper. *Puritan*, a new white, sent out by Woods Brothers last year, is the most promising white among recent introductions. The flowers are very large, of the purest white, beautifully fringed, and have a delicious clove fragrance. It is a fine healthy grower, but, so far as tested, is not a heavy cropper. *Tailby's Grace Wilder* is the ideal pink-variety, and singularly free from any tinge of purple at any stage. It is erect, low-growing, with fine grassy foliage, producing after the first crop an enormous percentage of single buds, rendering it distinctly valuable for long stems. The flowers are finely formed, though not large, beautifully fringed and very fragrant, keeping well when cut. It is, moreover, a true Perpetual, and in this respect is superior to a large number of new varieties of this shade, which, strange to say, more than any other revert to the old border type when raised from seed. *Ada Byron*, one of Mr. Fisher's new rose-colored varieties, is very promising. It is vigorous in constitution, with good blooming qualities, although rather late. The flowers are perfectly globular, on good stout stems, neatly fringed and fragrant. *Nickolson*, another of Fisher's, promises well, though not quite satisfactory. It carries a good round flower on stout stems, but is not, so far, a heavy cropper. The color is a lovely red-rose. *Daybreak*, the new and popular flesh-pink, fully bears out the reputation it has everywhere earned. It is a good healthy grower, though not very prolific. The flowers are very large and finely formed and very attractive.

There is a variety of opinions as to which is the best scarlet. Some grow *Portia*, a really good bright scarlet, though lacking size; others like *Florence*, while some prefer *Hector*. The latter variety is hard to beat where it succeeds. The flowers are of the largest size, of the clearest and brightest scarlet. *Florence*, a more reliable variety, said to be the seed parent of *Hector*, is a good clean grower and a splendid cropper. It has the defect, however, of weak stems, and produces an undue proportion of short buds. Mr. James Tulis grows three houses of it, which are carrying an immense crop of bloom. E. G. Hill, a promising new scarlet, is on trial, rather a coarse grower.

As to the best crimson now on the market, honors are divided between *Anna Webb* and *Ferdinand Mangold*. Both are strongly clove-scented and very similar in every way; the latter is said to be a seedling from *Anna Webb* and perhaps possesses a trifle more vigor. As far as I have seen them when growing together I have failed to see any difference; Mr. Tulis, however, has discarded *Anna Webb*. He had at the time of my visit a magnificent houseful of *Ferdinand Mangold*. The

air was filled with the perfume of more than three thousand blooms of large size and perfect form. It is not, however, a very profitable variety to grow, owing to the large number of side buds. In a white variety this is not so serious a fault, as many short stems are used in bouquet and other work.

Striped, or flaked, Carnations are not popular, owing to the prevailing fashion of arranging colors separately; for this purpose, distinct and telling self-colors are preferable, but when a mixed cluster is desired a few bizzarres contrast beautifully with the others. Mary Fisher is a lovely violet striped on yellow ground. Paxton is one of the best crimson striped on white ground.

Raising seedling Carnations is a fascinating pastime, if not very profitable. As with Chrysanthemums, there is no certainty that the results desired by making a certain cross will be reached. The general opinion is that the tree, or perpetual blooming, varieties have been evolved from the border kinds. But several years ago, when raising border kinds only from seed, I found among them very many true Perpetuals. Raisers here say that seedling Perpetuals often run back to the border kinds, and it is only by very careful selection the ever-blooming standard is maintained. And afterward, in order to perpetuate the variety true to character, it is necessary to select cuttings only from the flowering stems, a fact not duly considered by introducers of new varieties.

Wellesley, Mass

T. D. H.

Notes from the Harvard Botanic Gardens.

PLEROMA MACRANTHA.—One occasionally meets with this excellent plant in good condition throughout the country, but it is in general neglected. It is a free-growing shrub, branching abundantly, and may be grown to neat bush specimens or trained on a light-colored wall with equal effect. The opposite, ovate leaves are from three to four inches long, rich green on the upper surface, much paler underneath, and densely pubescent, as are the young branches. The flowers are borne singly on the upper portion of the shoots, and they are from four to five inches in diameter and of a rich blue-purple shade. The color, so rich and uncommon among our greenhouse-flowers, gives these flowers great value; and were it not for their brief duration of but two or three days, this plant would rank among the most useful of those cultivated under glass. The flowers, however, are produced so plentifully and in such quick succession in autumn and winter that their fugaciousness can be partly overlooked. Young plants only a few inches in height bloom quite as profusely in proportion to their size as larger ones, and, therefore, several of them are desirable in decorative collections. A few of them dotted here and there in a group of foliage or other flowering plants add a distinct richness of appearance, and since they can be grown with little trouble, it is astonishing that the plant is not more generally used. It was introduced in 1864 from Brazil, and with us thrives best in an intermediate temperature, with all the air and light possible in summer, without exposure to strong sunshine. The growth is made in the warm season, and at that time the plant needs plenty of water; but the supply must be gradually shortened as the flowers appear, and a very small quantity will suffice in winter. Plants intended for bush specimens may be sparingly pruned into shape at the termination of the flowering season, and repotted in spring. Cuttings of the young wood rooted in early spring will make neat flowering plants the following autumn. *Lasiandra* is a synonym of *Pleroma*, and often used in connection with this species.

URCEOLINA PENDULA.—This rare and lovely stove bulbous plant is now in bloom. The bulbs, as we find them in gardens, are roundish, and from two to three inches in diameter. Each bulb develops two, sometimes three, dark green oblong leaves about twelve inches in length. The drooping flowers are borne in large panicles at the apex of an erect scape from twelve to eighteen inches high, the filiform peduncles measuring an inch in length. They are urn-shaped, and the conspicuous portion is about two inches long by half an inch diameter, a rich golden-yellow for two-thirds of its length, the divisions being deep green, margined with white, at the spreading extremity. The leaves disappear when they have completed their work, thus leaving the plant wholly destitute of foliage, when the flowers develop a few weeks later. The bulbs should be turned out of the pots before they commence to grow in spring, and, after carefully removing the exhausted earth from about them, replaced collectively in large pots, or singly in small ones, keeping the summit of each on a level with the surface of the soil. They must now be placed in the stove and kept dry until growth begins, when water may be given

freely until the leaves have attained their full size and show signs of changing color. The supply of water should be gradually diminished as the leaves turn from green to yellow, and little or none will be necessary afterward. After flowering, the plants may be placed on a dry shelf in an intermediate temperature, and kept there until the following spring. *U. pendula* is propagated from seeds and offsets. Some English nurserymen, Messrs. W. Clibran & Son, of Altrincham, have recently been successful in obtaining a hybrid between this plant and *Eucharis grandiflora*. The new plant is figured in the *Gardeners' Chronicle* of August 20th last under the name of *Urceocharis Clibrani*, where it was described as interesting and beautiful, with flowers in character curiously intermediate between those of the two parents.

PLUMBAGO ROSEA has been known to cultivators since 1777. It bears dark red flowers, but is not so decorative as its variety *Coccinea*, obtained by the Messrs. Veitch, from the Nilgiri Hills in 1863. The latter plant, now in full bloom at this place, was very popular for winter decoration some years ago, but it seems to be greatly neglected now. It is a compact, evergreen shrub, from three to four feet high, the branches clad with alternate, oblong-ovate, bright green leaves, measuring from six to eight inches in length. The flowers are almost sessile, and borne in graceful terminal panicles from twelve to twenty-four inches long. The slender tube of the flower, emerging from a short calyx, is nearly an inch and a half long, and the spreading limb of five or six obovate parts, rather more than an inch across. The color is much brighter than that of the species, and the flowers themselves are produced in far greater profusion. The plant is constantly in bloom during the winter months, and it requires a stove or intermediate temperature. It is easily propagated by cuttings. Old plants should be invariably potted in spring, and a week or so before they should be pruned to within two or three joints of the old wood. They like a humid atmosphere when growing freely, but a trifle less heat and moisture will be beneficial later. A position close to the glass will always help secure their best development, and a little shading is necessary in summer, although the flowers take on a deeper and stronger color under full light and sunshine in winter.

Cambridge, Mass.

M. Barker.

The Forest.

The White Pine for Timber.

FEW questions in practical forestry have greater interest than those which relate to the best methods of growing the White Pine. Mr. Edmund Hersey has lately prepared an instructive paper on the general subject, which has been issued as a bulletin by the Bussey Institute. We publish this paper below, together with some notes which Mr. B. E. Fernow, Chief of the Division of Forestry at Washington, has prepared at our suggestion. We should be glad if other correspondents would give their views, since a full discussion of every phase of the subject is desirable.

As a timber-tree the White Pine possesses more good qualities than any other tree that is a native of Massachusetts. It is easy to grow it from the seed or transplant it when young; it will grow on a light sandy soil or on a peat-meadow; (1) on an ordinary soil the growth is quite rapid, making in thirty-five years from the seed a tree large enough to be sawed with profit into box-boards or coarse lumber; it makes lumber that can be used to advantage for a great variety of purposes.

When a Pine-forest is to be grown from the seed, an effort should be made to secure seed that is new and taken from the cone but a few days before the time it is wanted for planting. (2)

The cones containing the seeds begin to grow in June, and when of the size of the end of one's finger they stop growing until the following year, when, during the summer, they grow to full size, and perfect their seeds early in September; the first frost severe enough to kill Squash-vines opens the cones and the seeds drop out; (3) they are about the size of a Parsnip-seed, are very light in weight, and, having a little wing on them, they float along through the air in a slightly downward direction, reaching the ground sometimes twenty rods from the parent tree, but more frequently not more than from one to five rods. Soon after reaching the earth the little wing separates from the seed, and if the seed is to germinate it becomes partially or wholly covered with earth by a heavy rain, or by the pressure of the foot of a passing animal, or the falling

leaves may furnish sufficient protection to preserve its vitality. When nature is permitted to carry out her own plan of propagating the White Pine her work is more irregular than when assisted by man. Should the seeds leave the cones when there is but little force to the wind, they will drop very near each other at no great distance from the parent tree, and the result will be that a hundred small trees will grow on a space not large enough for more than one large one; but if the seeds leave the cones when the wind is high they will be carried great distances and spread over a wide territory. When man, without too much labor, can assist nature in the more even distribution of the seed it is desirable he should do so, but when he cannot, he may be able to prevent crowding by removing some of the small trees where they cover the ground too thickly, and setting them out in another place where they cannot interfere with each other.

When the seed is to be planted by man, the cones should be gathered just before the first frost in the autumn and placed small end up in the grass away from all enemies. After the first heavy frost, gather up the cones and shell out the seed by turning them small end downward over a vessel and giving them a rap with a stick, when the seeds will drop out. As soon as the seed is shelled it should be planted; it is a mistake to dry Pine-seed several months before planting.

The method of planting must depend on the condition of the soil; if it is a barren plain, shallow furrows may be plowed from east to west five feet apart, turning the furrows to the south, to afford a partial shade to the young plants. The seed should be planted on the south side of the open furrow, dropping two seeds near each other, then leaving a space of four or five feet, and covering the seeds with earth enough to keep them moist, say not far from one-half an inch in depth. (4) On rocky land, or where the soil is hard, dig out with a sharp spade a small sod where the seeds are to be planted, leaving the sod near the hole on the south side for shade, and planting the seed the same as in furrows. In a favorable season enough seed will germinate to cover the land; but if the season be unfavorable, a portion of the land will have to be reseeded the following year. Where the land is shaded by trees, germination will be more certain; but in such places when the seedling Pines are two years old they should be let out into the sunshine by removing the trees that shade them.

In localities where seedling Pines that grow naturally are numerous, it is not expensive to cover land with Pines by transplanting the young trees; to do this to the best advantage trees should be selected that are not over six inches in height, and in removing them a small ball of earth should be removed with each tree, care being taken not to expose the roots to the light or the air, and it is always best to do the work on cloudy days. The trees should be set five or six feet apart, and as they grow a sufficient number should be cut out to prevent crowding. When large enough for box-boards or coarse lumber, not more than four or five trees should be left on each rod of land.

On an average soil, thirty-five years is sufficient to produce White Pine timber of a profitable size to cut for coarse lumber, and, as a rule, on our New England soil; it is more profitable to cut the trees at this age than it is to let them stand long enough to produce trees large enough for clear lumber. It is a mistake to suppose that trees large enough and good enough for clear lumber can be grown on any soil; it is only on soils best adapted to the growth of the White Pine that it is wise to let the trees stand after they are more than twenty inches in diameter. On ordinary, and even on very barren, soils, the young trees grow quite rapidly, and unless the soil is very unfavorable, they will make a satisfactory growth until the largest trees are ten or twelve inches in diameter; beyond this size, if the land be well covered with trees, a very large portion of them will show signs of decay, and only a few growing in the most favored places will continue to grow rapidly; thus the decay on the lot will be nearly equal to the growth.

While it requires but from twenty-five to thirty-five years to grow the White Pine large enough for box-boards, it requires from sixty to seventy years to grow it large enough for clear lumber. When we consider the fact that there is always a ready sale, at remunerative prices, for coarse lumber, and also the uncertainty of getting first quality of lumber by thirty years of additional growth, it would seem unwise to encourage owners of Pine-timber forests to let the trees stand after they are large enough for coarse lumber, except on land strong enough to keep up a rapid growth until the trees are three feet or more in diameter. (5)

Four White Pine-trees set thirty-one years ago now measure, three feet from the ground, as follows: one sixty inches in circumference, one sixty-five inches and two sixty-six inches; the

sixty-five-inch tree grows in a wet soil, the remaining three are in a gravelly loam not rich enough to produce more than 800 pounds of hay to the acre. These trees when transplanted were not over six inches in height, and they have grown with other trees set at the same time so near each other that they now completely shade the land. Two trees set on a poor gravelly knoll twenty-five years ago now measure thirty-three and thirty-nine inches in circumference; these trees were about twelve inches in height when set; they have grown on open land.

There have been many opinions advanced in regard to thinning and trimming White Pine forests, and these divergent views have to some extent been caused by a difference of opinion as to how long the trees should be permitted to grow. If a Pine-forest is to be cut when large enough for coarse lumber, it should be treated differently from one that it is to stand long enough to make clear lumber; but little need be done with the former except to cut out the dead and dying trees, while the latter should be carefully looked after from the time the trees are eight feet high until the limbs on the trunk are all off to the height of twenty or more feet. As early in the growth of the forest as possible, the trees that are to remain for lumber should be selected, and the lower limbs on the trunk cut off as fast as it is considered safe to do so and not injure the vigor of the tree; this work should be done in June. After having chosen the trees that are to make the future forest, all the trees between them should be kept back and destroyed as fast as they appear to crowd the selected trees; but it is well to let the trees between stand quite near to the selected ones until they are twenty feet high if they do not overshadow them. By so doing the trees will grow higher and the trunks will have fewer limbs, thus securing clear lumber; in fact, a good White Pine timber-tree rarely ever grows in an exposed position; it must grow where it is surrounded by other trees, or it will not make a long, straight and clear timber-log; he who is to trim a timber-lot must ever keep this fact in mind, and do his work in such a manner as will best assist nature in her efforts to produce trees of the best type for man's use. It is not wise to attempt to grow more than 160 or 170 timber-trees to the acre, but by the selection of this number when the forest is young, they may be given ample room to develop, and there will be left room between them to grow a limited number of trees large enough for box-boards.

Edmund Hersey.

The article on White Pine, submitted for my examination, contains many good ideas and correct statements, but is not, in my opinion, correct in all respects. It contains many theories that are novel and which need to be proven, and some theoretically correct ideas which do not admit of practical application. For convenience I have indicated the passages with digits upon which I have commented.

(1) While certainly the White Pine will grow, and even thrive, on a wide range of soils, it would be misleading to name a badly drained soil, like peat-meadows, as a locality for it when speaking of its cultivation, and it should have been stated that the best site for it is a fresh to moist, well-drained sand-soil, although even a drier soil yields good results if only deep or permeable enough.

(2) This method of securing seed is neither necessary, nor in most cases practicable. It has, on the contrary, been well established for most coniferous seed, that a certain time of after-ripening increases the per cent. of germination. Most Pine-seeds are best kept over winter and sown in spring, as nature does. The White Pine is a curious exception, shedding its cones in the fall, and thereby indicating, perhaps, that fall-sowing is preferable for it.

(3) The theory that frost opens the cones is new. It is the drying by evaporation from the scales, and the consequent contraction of the outer-cell elements at their base, which makes the scales open; the same process which makes leaves and cones drop eventually. As the cones open near the beginning of October, he who waits for frost may lose his harvest. He had better cut the cones the first weeks of September, spread them on a dry place, a gently sloping roof, for instance, where the sun will open them, and the seeds can be readily knocked out and swept together, or else the drying may be done in warm rooms. The resin on the cones will prevent many seeds from fall-

ing out readily. One bushel of cones will yield less than half a pound of pure seed. In Germany the cones of Scotch Pine are sometimes spread at once over seed-places, and after sunny days turned with brooms to let the seed drop. Rainy days close the cones again.

(4) I would suggest that a more liberal use of seed would in the end be more economical, for the vicissitudes to which the seed is exposed under the unattended conditions of the forest-growth—different from nursery conditions—will necessarily prevent many from germinating; hence an abundant supply, say at the rate of three to four pounds per acre, promises surer success. I would caution those who propose to sow White Pine under the shade of older trees to make sure that the shade is not too dense and that it is soon enough removed. The absence of reproduction of White Pine in our forests, which has led lumbermen to deny that it can be reproduced at all, is probably largely due to the unfavorable light conditions which the seedlings find in the culled forest, where the shade kills them eventually.

(5) While the argument that it is more profitable to grow box-board pine than clear lumber pine may be correct, the writer owes us the proof or at least the basis for his assertion. I admit that profitableness of forest-culture, especially a comparison of the profitableness of two different methods of forest-management in the United States, is a matter almost impossible to discuss on account of the many uncertain and changeable quantities in the calculation. But it would have been possible to furnish some of the facts that need to be known even to estimate possibilities, namely, the quantity of material produced, and its quality at different ages per acre, and present prices for such amounts and qualities, when, together with an interest calculation on expenditures, the greater or lesser profitableness might be estimated. I have no reliable definite data as to yield from which to calculate the comparative profitableness of white pine under the given conditions. Possibilities, however, may be figured as follows: An acre of White Pine on poor soil may yield at thirty-five years 2,000 feet of box-boards at ten dollars a thousand, and ten cords of fire-wood at fifty cents a cord, or altogether twenty-five dollars. At eighty-five years we might expect from the same acre besides some ten cords of fire-wood taken in thinnings, if well managed, at the very least 8,000 feet B. M. of varying qualities, averaging at least sixteen dollars a thousand, and in addition forty cords of fire-wood at probably more than fifty cents, because containing more split-wood, the wood crop altogether amounting to at least \$148.00 per acre. If we had bought the acre at thirty-five years after planting for the twenty-five dollars which its crop represented, this would represent compound interest at more than ten per cent. It is to be expected that prices for white pine will have considerably appreciated in fifty years, and the yield by proper management could certainly be increased by fifty per cent., which would bring it to what is expected of Spruce in Germany on third-class soil. If Mr. Hersey has reliable figures to show otherwise, I should be glad to see them.

Washington, D. C.

B. E. Fernow.

Correspondence.

The Texas Barberry.

To the Editor of GARDEN AND FOREST:

Sir,—*Berberis trifoliata*, which your correspondent from Texas describes as such an attractive shrub, is hardy in Germantown. Last winter it had not the least covering, and it was not injured a particle. I have no doubt that if set in a clump of evergreens which would protect it, it would live out still farther north. The China tree has also attained sufficient size here to bear flowers and fruits. Many southern trees only need to be protected for a few years, after which they can take care of themselves. A further example of this is shown in two plants of *Halesia diperta*, which came from Kentucky. For several years in succession they were partly winter-killed, but for some years past they have not been injured, and now they flower and bear seeds every summer.

Germantown, Pa.

Joseph Meehan.

Meehan's Halesia.

To the Editor of GARDEN AND FOREST:

Sir,—I have often thought that the word "never" is a dangerous one for horticulturists or botanists to use. In the notes I furnished to Professor Sargent regarding *Halesia tetraptera* Meehani, which was figured in your issue of November 9th, it was said to be sterile or, at least, that we never found more than two or three seeds on the tree. That was true up to the present year when, as if to contradict me, the tree has borne, in the language of my foreman, a "soap-box full of seeds." Last year we had three seeds which were sown, and one of these grew this spring, and, so far as I am able to judge from the leaves, it is in every respect a normal *Halesia tetraptera*.

Germantown, Pa.

Thomas Meehan.

Gardening Beside a Hot Spring.

To the Editor of GARDEN AND FOREST:

Sir,—An interesting use of the water from some hot sulphur springs is being made by the Stanford family in Alameda County, California. One of the landmarks of the region is Mission Peak, at the base of which the Spanish settlers founded the old mission San José. One reason why the padres chose this place was because there was a fine group of hot sulphur springs, a few miles south, within easy reach. In fact, the mission would probably have been located at the latter point if there had been a large stream of cold water there. After the American occupation, a famous hotel was built at the "Warm Springs," and large numbers of guests came there by stage. The old register is full of the names of noted politicians and other celebrities of thirty years ago. Governor (now Senator) Leland Stanford purchased the ranch, and a few years later it became the property of his brother, the late Josiah Stanford, whose family make it their summer home. The great hill pastures have been transformed into vineyards of extreme productiveness and value, the district being "on limestone," and frostless.

But the particular attraction at the old "Warm Springs ranch" is now the use that is made of the surplus water. The temperature as it issues boiling from the cement-walled springs is about eighty-five degrees Fahrenheit. The supply is so great that, a few years ago, the owners began to irrigate the orchard, the garden of vegetables and the pleasure-grounds on the slopes of the hill. Everything flourished marvelously. The sediment was abundantly deposited along the channels, to be turned under by spade or plow, but no evil effects followed the use of the water.

Next, a large cement reservoir, low and broad, was constructed on the lawn, with small jets, and a fountain in the centre, and an attempt to grow Water-lilies was commenced here. The family grew interested, and Mr. Josiah Stanford, Jr., soon extended his experiments, until he now grows twenty-five or more species of the best aquatic plants that he has been able to procure. The water-tanks are not roofed over with glass, or in any way protected during the winter season.

Of the native American aquatics, Mr. Stanford grows *Nymphaea odorata*, *N. flava*, *Orontium aquaticum*, *Pondeletia cordata*, *Sagittaria variabilis*, *Nuphar sagittifolia*, *Nelumbium luteum*, and a number of other species and sub-species. Of the exotic aquatics, he has *Nymphaea Devoniensis*, *N. cœrulea*, *N. Lotus*, *N. dentata*, *N. scutifolia*, the pink Japanese *Lotus*, the large White *Lotus*, *Nymphaea cyanea*, *Trapa bicornis*, or Water-nut of China, *Nelumbium speciosum* of India, *Papyrus antiquorum*, some of the *Richardias*, the large white Australian Water-lily, and some other species whose names I have not obtained.

He received three plants of the *Victoria regia*, grown at the Golden Gate Park, San Francisco, but this Lily is very hard to move, even when small, and they soon died. He expects, however, to grow it from seed, and there seems no reason to doubt his success, as a temperature of from eighty to eighty-five degrees, Fahrenheit, can easily be had in the water. I should judge that the sheltered ravine in which the warm springs are situated would never be colder than sixty-five degrees at night, and, all things considered, Mr. Stanford will probably succeed with his giant Water-lilies.

It is to be remembered that the warm springs are less than forty miles from San Francisco, in a district where the deciduous fruits compose the bulk of the orchards. Olive, Orange and Lemon-trees are planted to some extent along the valley's rim, near the hills. The springs seem to raise the temperature, and modify the climate of a small area about the mouth

of the ravine, so that it is difficult to limit the horticultural possibilities here. The water-supply is large; a number of greenhouses could be heated by pipes, and the warm southern exposure, if terraced, would serve for a whole series of winter houses for the forcing of flowers for San Francisco. Any gardener can appreciate the comfort of having a constant flow of eighty-five degrees water, summer and winter, in a California climate. Of course, the temperature lessens in the lower tanks to eighty degrees, seventy-five degrees and seventy degrees, or thereabout, but it is eighty-five degrees many yards from where it breaks forth from the mountain.

Berkeley, Cal.

Charles Howard Shinn.

Notes.

Grape vines can be pruned any time after their leaves fall until late in February, but for many reasons it is best not to delay the work until very cold weather. When it is done on a comparatively warm day, it is not only more comfortable for the pruner but better for the vine.

The *Canadian Lumberman* says that in a warped board the convex side of the curve is always toward the heart of the tree. The warping is due to unequal shrinkage, and it is easily understood therefore why the middle plank is less subject to this trouble than cuts from the other parts of the log.

The thirty-eighth annual meeting of the Western New York Horticultural Society will be held at Rochester on the 25th and 26th of January. No one interested in horticulture, and especially in fruit-growing, can listen to the reports, papers and discussions at these meetings without pleasure and profit.

A dendrological society has recently been organized in Germany under the presidency of Baron St. Paul. Its object is to promote the scientific study of trees. Meetings are to be held regularly, and a journal specially devoted to this branch of botanical science, which every year is growing in importance and interest, is to be founded.

The one hundred and eighteenth volume of the *Botanical Magazine*, which closes with the number for December, is dedicated to Mr. Henry Trimen, Director of the Botanic Gardens of Peradeniya, in Ceylon, which "he has maintained in their former and admired condition," and which, under his able management, "have been greatly advanced in beauty, utility and scientific importance."

Professor J. T. Rothrock has given up his active work in the Biological Department of the University of Pennsylvania, and as general secretary of the Pennsylvania Forestry Association will use his best efforts to excite the interest of the people throughout the state in forestry, and to unite its citizens in efforts to preserve such forests as now remain in the state and to encourage propagation of new growths of timber.

When house plants are accidentally frosted, they should be dipped into cold water or, if too large for that, they should be sprinkled with cold water and then set in total darkness. Under such treatment many of them will come out in two or three days as fresh as ever. Of course it is better that they should not be allowed to freeze, and it is a good plan to roll the stand away from the window on cold nights, or to fasten several thicknesses of newspaper between the plants and the window.

A recent issue of *Le Journal des Orchidées* contains the portraits and descriptions of two remarkable plants recently exhibited from the collection of Monsieur G. Warocqué at the fortieth meeting of L'Orchidéeenne at Brussels. The first was a marvelous specimen of *Cypripedium Harrisianum*, the first artificial hybrid *Cypripedium* which flowered in Europe. It measured more than four feet in diameter and carried ninety-four flowers. Not less remarkable was the specimen of *Cattleya Warocqueana* with sixty-four flowers in four, five and six flowered clusters.

At the last meeting of the Montreal Horticultural Society Mr. John Perrin, in a paper on the "Culture of Mushrooms in Winter," recommended that light sheets of paper, such as newspaper, should be spread over them as soon as the clumps appear, and that they should be syringed lightly two or three times a day. Under this treatment they grow faster, become larger and weigh more, having perfect form and color as well as improved flavor. If allowed to become to any extent dry and discolored by the air, they at once acquire an unpleasant taste similar to that of meat which has been too long exposed to the air.

A writer in the *New England Magazine*, in speaking of the Sahara, says that however barren it is in summer the soil is so rich that the day following a rainfall wild Grass will be observed growing, especially in the depressions, but the sunshine in a day or two will soon scorch it. The general surface of the Sahara, although parched and fiery in summer, wears a mantle of green on all places uncovered by arid sand after the first autumnal rainfall. It keeps green all winter, and from that verdure the Bedouins derive their only means of life, the food of their numerous herds of cattle, which is the only tribute which that immense waste pays to humanity.

A correspondent of the *American Florist* writes that a grower of Carnations near Nashville, Tennessee, sets his plants in the open ground in baskets about four inches in diameter made from common wire fencing with a two-inch mesh. The baskets are made by cutting the fencing into strips about twelve inches long and four inches wide, bringing the ends together and folding one end in. Small plants are set out in these baskets in the spring, where they remain in the open ground all summer, and in the autumn the basket is lifted with the plant and transferred to the greenhouse bench. The plant thus has the advantage of being bedded out constantly and is always transplanted with a good ball of soil.

Monsieur Edward André, the distinguished landscape-gardener of Paris, has been appointed professor of the architecture of gardens and greenhouses at the *École Nationale d'Horticulture* at Versailles. The new course will include theoretical and practical instruction in the art of designing and constructing gardens and parks. Excursions will be made under the direction of the professor in order that the students may be able to see the best examples of the different styles of landscape-gardening. This is the first time that a chair specially devoted to furnishing instruction in this art has been created, and Monsieur André has the honor of being the first professor of landscape-gardening. Systematic instruction in this most important of all branches of the gardener's art could not have been entrusted to a more able, learned and experienced practitioner, and other schools and universities will do well to follow the example which has been set for them at Versailles.

The following list of fragrant Chrysanthemums is given in an English paper: Chryssippe, an incurved flower of bright rosy purple edged with white; the standard old Cullingfordi, a reflexed variety and one of the best crimsons; Dr. Sharp, another reflexed kind, amaranth-purple in color; Exquisite, a pure white single-flowered kind with long narrow florets; Faust, bright purple and incurved; Gus Harris, a single flower with bright lilac florets; Annie Manda, a beautiful hairy variety of pure white; Mrs. Langtry, a pale rose; Nymphæa, a single white kind with florets incurving with age, and Progne, having deep purple flowers of medium size with reflexed florets. The last is pronounced the best Chrysanthemum in cultivation for fragrance. It blooms profusely and the odor resembles that of the Violet. The fragrance of some others is agreeable but indescribable, except in Dr. Sharp, which somewhat resembles that of Progne, and Gus Harris, which is Hawthorn-like.

Bulletin 44 of the Cornell University Experiment Station is devoted to the Pear-tree psylla, which suddenly appeared early in 1891 in many widely separated portions of New York and the neighboring states, and destroyed thousands of dollars' worth of fruit and many valuable trees. It was not a new pest here, having been imported, probably, as long ago as 1832 from Europe. No doubt it has been slowly increasing in numbers until, under favorable opportunities, it all at once worked immense damage. This year the insect did little injury in the orchards which it devastated last year, but it is an enemy against whose attacks pear-growers must ever be on the alert. They should examine their orchards just when the leaves are expanding, and if the nymphs are numerous the trees should be sprayed at once with the kerosene emulsion. A second and third spraying will be profitable if the attack is serious, and especially if but little rain falls to wash off the honey-dew. The destruction of the nymphs is practicable during a period of about two weeks in the middle of May, and a thorough spraying then will so discourage them that little attention will be needed later in the season. Most of the damage is done before the middle of June, but spraying after this date will decrease the number of insects from which the hibernating forms are produced, and the orchard may be saved from a severe attack the following year. The pamphlet contains twenty-five pages, and will be found very complete and interesting as well as instructive and useful to every one who has a Pear-tree.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLES:—Road-side Shrubberies. (With figure).....	613
Our National Parks and Forest Reservations.....	613
Picturesque Names for Flowers.....Mrs. J. H. Robbins.	614
A Few Texas Shrubs.....J. Reverchon.	615
What Plants may become Weeds?.....F. H. H.	615
FOREIGN CORRESPONDENCE:—London Letter.....W. Watson.	616
CULTURAL DEPARTMENT:—The Formation and Care of Lawns.....	618
Outdoor Cultivation of European Grapes.....Alex. W. Pearson.	618
Iris and their Cultivation.—II.....J. N. Gerard.	619
Bacterial Disease of Beans. (With figure).....Professor Byron D. Halsted.	620
The Propagation of Hardy Plants.....E. O. Orpet.	620
Tagetes signata.....C. W. Mathews.	621
Imantophyllum miniatum.....Mrs. Danske Dandridge.	621
CORRESPONDENCE:—The Black Knot.....E. P. Powell.	621
The Spirit of the California Fruit-growers.....Charles Howard Shinn.	621
Early and Late Strawberries.....H. A. Eaton.	622
Desecration of Natural Beauty.....H. M. A.	622
New Cypripediums.....Joseph Manda, Jr.	622
Plantago media.....J. Franklin Collins.	622
MEETINGS OF SOCIETIES:—The Kansas State Horticultural Society.....S. C. M.	622
RECENT PUBLICATIONS.....	623
NOTES.....	624
ILLUSTRATIONS:—Roaring Brook Road, Sheffield, Massachusetts, Fig. 105.....	617
Pods of Beans showing Bacterial Disease, Fig. 106.....	620

Road-side Shrubberies.

SO much has been written of late concerning rural roads and road-sides that the paramount importance of the subject can alone justify further reference to it; but we are convinced that there is hardly one reform which would add more to the comfort and pleasure of life in the country than a general improvement in the smoothness and solidity of its road-beds and the attractiveness of its road-borders. Only a fortnight ago we took occasion to speak of the needless defacement of scenery caused by the building of railroads, the opening of mines and the working of quarries, not to speak of the disfigurement of picturesque rocks and other prominent objects by the paint-brush of the advertiser's agent. One of the most flagrant offenders in this way, however, is the path-master, who, under the existing laws of most of our states, is invested with limitless power of destruction when the farmers of his district assemble to work out their road-tax. It is not probable that one path-master in a hundred ever gives a thought to the actual beauty which he destroys or to the possible beauty which he neglects to develop in his work, and yet the road-sides are directly under the eyes of the people more continuously than any other part of the country. These same road-sides, too, furnish unrivaled opportunities for producing beautiful effects with grass and flowers and foliage, so that the sins against good taste which are here committed are almost universally prevalent and of a most aggravating quality.

If any one in the course of business, as a manufacturer, for instance, violates the sensibilities of his neighbors by poisoning the air with noxious or offensive odors he can be prosecuted for maintaining a nuisance. In the same way, if he offends by disturbing noises, he is also liable to indictment. Certainly, the sense of sight should be protected from out-

rage as well as the sense of smell or of hearing, and there is no sufficient reason why the public should not be protected from the depression and annoyance which comes from the destruction of natural beauty. Now, there are many road-sides where a thicket of shrubs or a natural growth of trees and vines should not be allowed to remain. No one can drive through the best portions of the farm-lands of Lancaster County or Bucks County, in Pennsylvania, for example, without noting the beautiful effect of the green-sward as it flows smoothly under the open fences from the grain and pasture fields and across the road-border to the very edge of the wheel-way. A weed or clump of bushes here would look as much out of place as it would in the adjoining meadows. But in large sections of the middle states and of New England, where the land is rough, and where the fences are often of stone, nothing could be more beautiful or harmonious than the natural growths which nature so bountifully provides. When this border of shrubbery is cleared away and burnt off, nothing is left above the blackened ground but the stumps, bare rocks and raw banks, so that a desolation is made of this verdurous wall, which always looks, when left to itself, cool and beautiful, and has a fresh interest every rod.

The illustration on page 617 is simply a passage in a typical Berkshire County road in Massachusetts, from a photograph taken by Mr. G. S. Olmsted, of this city. This road winds its way beside a roaring stream through woods and thickets, with vistas opening here and there to give the view of some distant mountain-range or a nearer view of rolling pasture-lands, but it furnishes constant delight to the eye and food for the imagination. Of course, a road-side should not be made a breeding-ground for larval pests or a nursery of plant-diseases. Trees which naturally support injurious insects, or which invite the attacks of black-knot and other fungi, should be cut away just as they should if they were inside the farm-fences. But as the road winds from meadow to upland, through hollows and over ridges, offering every diversity of soil and exposure and degree of moisture, a place will be found for all of our best native shrubs and trees and festooning vines and herbaceous plants, and the richness of our flora will ensure endless variety. There are few road-sides in the more rugged and hilly portion of the country which could not, with a little care, be made objects of beauty, winter and summer, fragrant with flowers in their season, and vocal with the songs of birds.

Our National Parks and Forest Reservations.

THOSE portions of the annual report of the Secretary of the Interior which refer to the national parks and timber reservations are not reassuring. We are told, for instance, that a visitor to the Yosemite will pass through a forest within the limits of the National Park, upon which a private individual has some claim, and here he will see magnificent Pines, five feet in diameter and from a hundred to two hundred feet in height, being cut down simply to utilize some twenty or thirty feet of the trunk for shingles. He will find also that the Commissioners have never taken any counsel with an expert engineer or landscape-gardener for the purpose of making a thorough study of the valley and adopting a systematic plan of improvement which could be carried on through years; but, on the contrary, they are making spasmodic efforts to "underbrush" the valley without any regard to the natural beauty of the place. No destructive fires have occurred here this year, but there is little guarantee of future safety, since the penalty for starting a conflagration is nothing but a fine. The foreign sheep-herders, from whom the danger largely comes, have no money, even if they were convicted, and the damage from fires might be incalculable. In the Sequoia Parks the ground is covered with fallen timber, which is dead and dry, and the forest-floor is so inflammable that a fire would work immense destruction. The Portuguese and Mexican herders pastured 500,000 sheep last summer in the Kern and King's River valleys, mostly on Govern-

ment land, for which the owners of the sheep paid no rent nor taxes, and these immense herds devour everything in the way of vegetation. The difficulties in the way of restraining these cattle and sheep-herders from trespassing on the reservations are discouraging, and until the parks are surveyed, the boundaries distinctly marked, and penalties provided against lawlessness, these forests are in constant danger.

The vandalism of tourists is complained of in the report on the Yellowstone Park. Poachers have settled all around it so that the game has no adequate protection. There are four hundred buffaloes on the reservation, and a few moose in the southern part, but as they roam beyond the line they are in danger of extinction. There are several large bands of mountain sheep here, too, but as their finest range is north of the Lamar and Soda Butte Creek they will disappear if that portion of the park is cut off in accordance with the bill for establishing new boundaries which is under consideration by Congress. The Secretary, for this and other reasons, opposes this so-called segregation project, and advocates the passage of an act defining the boundaries of the park as they now exist, including, however, the timber reserve added by the President's proclamation. Some strong arguments against the surrender of the north-east portion of the park to the Cooke City lobby are set forth in the issue of *Forest and Stream* for December 8th. We have already spoken of the fact that six forest-reservations, including three and a quarter million of acres, have now been established under the new law, and this beneficent policy will probably be further carried into effect, but unless the reservations are protected by detachments from the army, as has been done in the Yellowstone Park and the Sequoia Park, there is no way to save them from the depredations of thieves or the still more sweeping desolation by fire.

The sum of it all is that we have set apart from the public domain certain tracts for national parks and forests, but their boundary-lines have never been defined, and no law has ever been enacted which establishes a system of government within their limits with appropriate executive machinery and prescribed penalties for the violation of its provisions.

Picturesque Names for Flowers.

MRS. FANNY D. BERGEN has contributed to the *Journal of American Folk-Lore* a valuable and interesting collection of popular plant names that are found in America, showing that wherever people live in close contact with nature, there arises a pleasant homely sympathy with floral growth, that results in names which are often agreeably descriptive of some quaint look of the flower, or of its practical uses.

In England the common flowers all have names endeared to us by inheritance, and often embalmed in poet's verse; and in our own land, while we keep many of the dear old terms, others have grown up among the country people or the children, that are often equally happy and appropriate.

These names Mrs. Bergen has with much pains gathered together in a pamphlet, which is full of interest to the reader who loves the simple blossoms that carelessly adorn our roadsides and meadows, or are cultivated in the cottage garden-patch. Indeed, it makes us wish that the new and splendid blossoms which the skilled gardener's care is ever producing might be equally inspiring to the florist, so that the glory of Chrysanthemums, for instance, with their wealth of color and luxuriant form, might be known to us, as they are to the Japanese, by delicate and suggestive appellations, rather than by the tiresome complimentary names of people, which are without significance or beauty.

Our oriental brother, who loves his garden, and delights in this splendid opulent blossom of the fading year, lets his poetical fancy revel in the suggestions of these many-tinted florets, and, like a lover, finds fanciful and tender names to describe these curled darlings of the parterre, such as Silver World, or White Dragon, or Companion of the Moon, which fitly convey the snowy glories of some great white blossom. Again, he calls one varied yellow flower Golden Brocade; a paler golden one, Dye of the Dew; a dull red beauty he entitles Shadows of the Evening Sun; another, with a tinge of orange in the

carmine, is Moon's Halo; a third, which glows afar, is Beacon Light; a fourth, with linings of yellow to its maroon petals, he styles Leaves in Frost. For a soft globe of dubious hue he finds the descriptive term Thin Mist; a pale pink he calls Sky at Dawn; another white one lives before us with its myriad blooms as Starlight Night, and one, with tangled petals wildly straying, he styles Disheveled Hair; while for a glowing flower of vast proportions, Terrestrial Globe is not too comprehensive a term to his charming imagination.

Contrast these poetical and delicate descriptive titles with the prosaic lists of the nurseryman, with his Mrs. John Smith, and Abijah Jones, and Hezekiah Brown, or their equivalents, to degrade these royalties of the garden from their high estate; and mark the difference between a sensitive and poetic people, who truly love a blossom, and the unimaginative, hard-headed Anglo-Saxon who trades in herbaceous plants.

But when quite out of heart with the lack of appropriateness in the catalogues of Roses and Pæonies and Lilies that we are yearly compelled to study, it is pleasant to take up this little list of Mrs. Bergen's and see what our people will do when let alone.

Here are found such pretty names as Cups of Flame for the gay *Eschscholtzia*, and Eye-bright for the *Drosera rotundifolia*, which is more closely translated in our botanies as Sun-dew, from its shining exudations. In Canada they call the Red *Lychnis* Scarlet Lightning; in Ohio, Fireballs. In some places the *Claytonia*, or Spring Beauty, is known as Good-morning-spring; in Massachusetts the *Argemone Mexicana* is Bird-in-the-bush, and *Silene Armeria*, None-so-pretty, while the explosive Jewel-weed, or Touch-me-not, is Kicking-colt, and the *Polygala paucifolia* is Babies'-toes. The pretty names for the starry *Houstonia* are numerous, and so charming one scarcely knows which to choose. Blue-eyed Babies, Quaker Ladies, Angel Eyes, Innocence, Nuns, Bright Eyes, are all appropriate, and there are more besides. There is no sweeter name for the Pansy than the old-fashioned New England one, Lady's Delight, but all through the middle states one hears of it only as Johnny-jump-up. In North Carolina the children call the Violets Rooster-hoods, probably the same variety that some of our botanies recognize as Hood-leaved Violet, from the curl at the bottom of the leaf. The omnipresent Life-everlasting is in northern New York called Feather-weed, because it is used by poor people to fill beds when feathers are lacking; and here in Hingham many people call them Pincushions, from their round ball-like effect, with tiny black spots like the heads of pins scattered over them.

The Chicory's azure blossoms are called Blue Sailors in Brooklyn, New York; the *Chimaphila umbellata* is known in Maine as Love-in-winter; the *Monotropa*, with its spectral white pipe, has the fitting name of Ghost-flower in New Brunswick, and the *Castilleja coccinea*, with its scarlet-painted cup, is in the west called Prairie-fire, and in Massachusetts, Indian Paint-brush, or Red Indians. *Euphorbia marginata* is known in New Hampshire and Nebraska by the picturesque name of Snow-on-the-mountains. Whether this is the flower that inspired Dante Rossetti's tragic little verse with its recurring refrain,

The Wood Spurge hath a cup of three,

I know not, but the poem has added a poetic interest to all the Spurges.

In some New England towns the fragrant Bayberry, with its gray-blue fruit, is known as the Candleberry, from the use made of the wax that exudes from it, which, obtained by boiling, makes a tallow fit for candles. The wild Orchids, with their suggestive shapes, are always fruitful in descriptive names. Lady's-slipper, Whip-poor-will Shoes, Dragon's-mouth, Nerve-root, Dragon's-claw, Coral-root, Adam and Eve, Ladies'-tresses, Ram's-head, are all applied to different members of this curious family.

Yucca filamentosa, with its sharp points and hairy filaments, is known in Massachusetts as Thread-and-needle, and in Texas as Eve's Darning-needle. For some unknown reason, similar, no doubt, to the one which causes that

Il n'y a pas un âne en toute la France
Qui ne s'appelle pas Martin,

all the *Trilliums* in New Brunswick are called Benjamin, sometimes with the addition of an opprobrious epithet referring to their odor. In Wisconsin this beautiful Wake Robin is called the Trinity Lily. In New England *Trillium erectum* is recognized as Bumble-bee-root, or Squaw-root. We all know the significance of Jack-in-the-pulpit, but the same *Arum* is known as Indian Cradle, from a fancied resemblance to a papoose with the hood drawn over its head, and also as Dragon-root and Lady-in-a-chaise.

To the Fungi all sorts of superstitions attach. One kind is called Devil's Umbrellas, another Death Baby; this latter deemed so ominous that people rush out and exterminate it when it springs up in the yard, as it is thought to be prophetic of death. The Algæ, too, with their uncanny forms, have names of evil import, such as Devil's Apron, Devil's Apron-strings, and the like. It is impossible to quote from Mrs. Bergen all the various names that popular fancy has attached to its familiar friends of road-side and garden, but they show that living interest in the flowers about them which the man of science and the gardener, with all their keen interest in a new variety, too often lack.

While it is necessary to have Latin and Greek names, which are universally intelligible, for plants, we have a right to ask also, for our common use, something from the florist which shall bear the same relation to our understanding that the classic names did to those who gave them. The Greek did not name his flowers in Sanscrit or Coptic, but in his own tongue. His word Anemone, for the Wind-flower, was a thing of meaning to him, not merely a noun. His name for the Poison Hemlock, Koneion, from konos, a top, which was significant of the dizziness and whirling that resulted from its use, bore with it a warning to the incautious. The Beech (Phegos) he named from its edible nut; the Yew (Taxon), from the bow and arrow, for one of which it furnished the wood, for the other the poison. The Chestnut was called after the Thessalian town, in which it grew to splendid size. The name Walnut bore reference to the round shape of the nut. The Plane Tree's appellation characterized its large broad leaves. He called his Coriander after a pungent insect on account of the smell of its leaves; his Parsley from the stones amid which it grew; his Celandine bore the name of the swallow, with which it came and fled. The Cedar, which was the fragrant wood burned upon altars, was named from the word which meant sacrifice.

So also the Roman names of trees are significant. The Maple was called Acer, perhaps from its sharp-pointed leaves, though some authorities say it was so called because its tough wood was employed for the handles of pointed weapons, spears, javelins and the like.

The Poplar, from its planting along the public-ways, was called Populus, the people's tree. Their names for the Walnut (Juglans) signified Tree of Jove, from its majestic proportions. The title of the Palm bore reference to its hand-shaped leaves; that of the Cypress, to the island of Cyprus, where the altars of Venus were adorned with its evergreen boughs. From their northern conquests the Roman legions brought back not only trees, but their names—the Birch, the Willow, the Pine and Fir all bearing Celtic names significant mostly of their use or place of growth. Salix came from two Celtic words signifying near water; Pinus, from the rocks and mountains, where it made its lofty home; Carpinus, from *car*, wood, and *pino*, the head, alluding to its use for making yokes for cattle. Quercus is from the two Celtic words, *quercues*, signifying noble tree, because the Oak bore the sacred Mistletoe. The Druid title for Oak, *deru*, lives still in their own name, which is derived from it, and at every turn we find an interesting significance in the terms which preserve at once to us the history and the habits of an ancient people.

There is no reason why Americans should not name their own flora in a way to be equally valuable to succeeding races in the far-off future. We lack neither imagination nor poetical feeling, though very little of either seems to find its way into professional nomenclature. It is a pity that some nurseryman or florist should not distinguish himself by finding fitting nouns to portray the glories of his magnificent fruits and flowers, and the prizes offered for the best name for a new Tomato or Grape are efforts in the right direction. Still, our Chrysanthemums and Roses have reached a much higher development in size than they have in epithet. Therefore, I make a plea in their behalf that henceforth some attempt may be made to render them as interesting in name as they are in nature.

Hingham, Mass.

M. C. Robbins.

A. Few Texas Shrubs.

I HAVE been trying in my garden a few of the shrubs which are native to this region and which will prove hardy in most of the southern states. Some of them are truly ornamental, and all have flourished without unusual care or cultivation.

Chilopsis saligna, generally known as the Flowering Willow, is a native of the south-western part of Texas, and is already found in many gardens. It grows from ten to fifteen feet high, and the large flowers in terminal racemes stand well out from the mass of narrow leaves. These flowers, in shape like those of the Catalpa, are pink, with a broad darker spot

and a yellow marking on the lip, and at night they exhale the odor of sweet Violets. The whole shrub has the appearance of a dwarf Willow, and its beautiful flowers are borne abundantly all summer long in spite of dry or hot weather. It grows well in a sandy or a limestone soil, and is readily propagated from cuttings as well as from seeds, which are borne in long pods like those of the Catalpa.

Acacia fragrans grows wild on many rocky bluffs west of the Brazos. The only one I have raised, however, flourished on limestone soil. The foliage is elegant, although a little thin, and the delicate pink and very fragrant flowers are carried in round heads. They generally appear in April, and keep opening until autumn. I remember to have seen one of these shrubs in Brown County which was in bloom before the leaves were fairly developed, and it was a solid mass of pink some five or six feet high. In the same region grows Rhus microphylla, a shrub whose small and greenish flowers appear before the leaves in spring. The bright orange-colored fruit contrasts pleasantly with the fine green of the foliage, but I can hardly recommend the plant except for variety.

Lippia lycioides, another shrub of the same region, prefers sandy soil, and it may attain the height of ten feet when well developed, though it is generally more dwarf. The grayish leaves are small, and the flowers, borne in a multitude of racemes, are white and very small. The whole appearance of the shrub is not showy, but it blooms perpetually, and the flowers are so sweet-scented that it certainly deserves a space in the garden.

Rosa setigera, var. tomentosa, grows wild in swampy woods, but it makes itself perfectly at home on dry upland. It is a straggling half-climber, and, as I have it covering a stretch of rumbling old stone wall, it is a beautiful sight in May; but, unfortunately, its bright pink flowers appear but once a year.

Cæsalpinia pulcherrima is a small shrub which one often sees in Texas gardens. The compound leaves are very elegant, and the large flowers are borne in great terminal racemes. They are light yellow, and the crest of scarlet stamens with which they are crowned adds very much to their beauty. The pods are large and flat, and contain a few large seeds, which germinate very readily. It blooms abundantly, but it is not perfectly hardy here.

Dallas, Texas.

J. Reverchon.

What Plants may become Weeds?

SO many cultivated plants escape to become troublesome weeds, when the soil and conditions are favorable, that it is necessary to inquire what attractive plants may safely be introduced into cultivation? Protests have been made against such species as Calystegia pubescens, Apios tuberosa and Helianthus divaricatus being offered by nurserymen. There may, however, be localities where not any of these would, under the best treatment, become weeds. I have had much difficulty in growing Apios tuberosa in some soils. Generally, I believe, the worst weeds we have are not indigenous, but are introduced directly by cultivation, or with cultivated plants, and soon become acclimated, and thrive better than other plants already established.

Sedum Telephium (common Live-forever) is a dreaded weed when it gets into a meadow or cultivated field, but I have seen it established in a sterile spot on a rocky road-side for twenty years, with no apparent increase. Left entirely to itself, it grew and flowered, without spreading, so luxuriantly as to suggest its usefulness in covering barren places where little else would thrive. Five years ago a neighbor found in his pasture a small patch of the Venus Paint-brush (Hieracium aurantiacum). I warned him of its inclination to spread in our Vermont soils, and at that time a dollar would have eradicated it. He had no fears of it, however, until two years later, when he found it had scattered itself over a good portion of his farm. He has since spent nearly two hundred dollars in digging and plowing it under, and the end is not yet. Our soil and climate seem to have just suited it, or to have modified it so as to suit the soil and climate, for in some localities good farms have been overrun with it, and on stony or other rough pastures, where the plow cannot be used, it is master of all. It is a common species among the flower-seeds of foreign catalogues, and I presume is offered by Americans, too. It, perhaps, seldom finds so congenial a soil as ours, for here it not only multiplies by its underground stolons faster than any tame Strawberry I ever saw by its runners, but its seeds all seem to mature and are scattered far and wide by the wind.

The common Virgin's Bower (Clematis Virginiana) is sometimes a pest in meadows that are mown every year, even crowding out the grass. This occurs, however, only when the soil is light and moist. We often have to coddle it when trans-

planted until it gets a good hold on the soil. In Vermont the shrubby Cinquefoil (*Potentilla fruticosa*) is a local plant usually growing on rocky banks and under cold cliffs; it is seldom more than two feet high, and, I believe, never spreads to any extent; but in some parts of north-western Connecticut whole fields are entirely abandoned to this shrub, where it grows most luxuriantly four feet or more in height in an almost impenetrable mass. The conditions for its development there are most favorable, and it spreads both by seed and roots. But who would discard entirely the Virgin's Bower or the Bitter-sweet (*Celastrus scandens*) from cultivation because they occasionally find locations so favorable to their increase as to become weeds? It would be as reasonable to expect seedsmen to discontinue the sale of the Parsnip or Carrot because they sometimes escape from gardens.

Charlotte, Vt.

F. H. H.

Foreign Correspondence.

London Letter.

PUBLIC PARKS AND GARDENS IN LONDON.—There are 257 public parks, gardens and playgrounds in the metropolitan area of London. Of these eighteen of the most important, such as Kew, Hyde Park, Regent's Park, Richmond Park, Epping Forest, etc., are maintained by the Crown, that is, out of general taxation, fifteen by the Corporation of London, 108 by local authorities, and fifty by associations, the clergy, etc. The remainder are now controlled by the London County Council. Besides such important open spaces as the Thames Embankment, Hampstead Heath and Parliament Hill, the area governed by the County Council includes the large parks of Battersea, Victoria and Finsbury, the whole being about 3,000 acres in extent.

Efforts are now being made to add considerably to these open spaces, and to place the whole of them, except those controlled by the Crown, under the management of the London County Council. While some of these open spaces are laid down with turf and paths, and planted with trees and shrubs, in the usual gardenesque fashion, others are handed over to football, cricket and similar games. Some are little more than large school-yards, in which children can romp and find healthy open-air exercise. There are many influential bodies and individuals who make it their duty to see that these open spaces shall be available for recreation, so that even the poorest children and adults can here enjoy a breath of fresh air. London is well enough supplied with large parks, but she still requires a large number of small gardens and playgrounds, more especially in the crowded districts. Excellent work in this direction is done by the Public Gardens Association, who purchase and lay out available pieces of ground and then hand them over to the care of the local or other authorities. It is impossible to overestimate the value of this work of providing suitable and convenient recreation and breathing-spaces in all large towns. It is coming to be generally recognized that land should be set apart for such purposes when it can be secured at a cheap rate and wherever there are evidences that the population will become crowded.

The London County Council had under consideration some time ago a proposal to appoint a superintendent of all the parks and open spaces under their control at a salary of £700 a year. For some reason this fell through, and recently they have appointed a superintendent at £500. It is disappointing to horticulturists that the County Council should have selected for this office a man who has hitherto held the post of assistant architect. In England the architect and the landscape-gardener do not, as a rule, agree in regard to the laying-out of gardens. At the same time we pride ourselves on the high art displayed in the construction of many of our gardens. To make the matter still more surprising, the County Council now advertises for a gardener to act as assistant to the architect at a salary of £300 a year. This, remarks the *Gardeners' Chronicle*, "is a triumph for the architects and a humiliation to the landscape-gardeners."

The sudden death of the Duke of Marlborough, at Blenheim, a fortnight ago, has resulted in an arrangement for

the sale, by auction, of the very extensive collection of plants which the late Duke, who was an enthusiastic horticulturist, had formed during the past ten years. Until about two years ago the collection of Orchids at Blenheim was the largest in point of numbers of any private collection in England. Latterly, however, many of the Orchids have been disposed of and replaced by Roses, Carnations, etc. Even now, there remain 25,000 Orchids, beside enormous numbers of indoor plants of all kinds. The sale is to take place on the 19th of December and following days.

SEEDLINGS.—Sir John Lubbock's latest contribution to science is a large work in two volumes on seedlings. He states in the preface, "The germination of plants is certainly not the least interesting portion of their life-history, but it has not as yet attracted the attention it deserves. . . . Under these circumstances, it seemed to me that the subject was very promising, and it was evident that Kew would afford unrivaled opportunities for such an investigation." The vast number of illustrations of seedlings, and still more numerous descriptions of others, nearly every one of which was prepared from living examples grown at Kew, prove that Sir John has made the most of the opportunities Kew offers for work of this kind. Enormous numbers of plants of every description are annually raised from seeds received at Kew, a large proportion of which either fail to thrive or are wanting in those characters which would render them suitable for artificial cultivation. Consequently many of the seedlings figured and described in Sir John Lubbock's work are of plants which probably could not be seen anywhere in the seedling stage except at Kew. The work has been in progress since 1885, when a young gardener with an aptitude for drawing was selected from the Kew staff for the work required by Sir John. This book will, no doubt, prove of considerable service to botanists of all kinds. It contains illustrations and descriptions of seedlings of nearly all the natural orders, and in many cases of numerous genera in each order, of Phanerogamous plants.

CANNAS.—The important position now occupied by these plants is due to the new race of dwarf, large-flowering, richly colored kinds which has been obtained recently, chiefly by Continental growers. The genus *Canna* has long held a place among garden-plants, but, except for their foliage, they were not of much decorative value, in England, at any rate. *C. iridiflora*, generally called *C. Ehemanni*, was the first large-flowered kind to attract general attention; this was about ten years ago. The history of garden Cannas remains to be told. The Royal Horticultural Society has, therefore, been fortunate in securing the services of Mr. J. G. Baker, F.R.S., for this purpose, and he will read a paper on Cannas at a conference of that society to be held next year. Mr. Baker is certain to do the work thoroughly, but, at the same time, it is likely to prove troublesome. There are something like a hundred specifically named Cannas in gardens, and probably these will be rendered down by Mr. Baker to about a dozen good species. The genus is represented in the Old World only by the Indian Shot (*C. Indica*), and in tropical America by twenty or thirty species. Mr. Baker will be grateful for any specimens or information of any kind relating to Cannas, and more especially to the garden kinds. Plants for cultivation and observation at Kew will also be most acceptable.

I may mention here a new hybrid *Canna* figured in the *Revue Horticole* this month, page 540, which was raised by Monsieur Maron from the tall white-flowered *C. liliiflora*, crossed with one of Monsieur Crozy's large-flowered seedlings. It is named Madame J. Sallier, in compliment to the wife of Monsieur Sallier, the Paris nurseryman, who holds the stock of this hybrid. It is tall in stature, the flowers are very large, and arranged on the spike not unlike those of *Gladiolus Breuchleyensis*; their color is rich crimson, with yellow marks and shading.

TACSONIA SMYTHIANA.—This is figured and described in the *Gardeners' Chronicle* as a new hybrid which origi-

nated in the gardens of Basing Park, *T. mollissima* and some other species of *Tacsonia* being the supposed parents. It has trilobed, serrated, dark green leaves, conspicuous ciliated stipules, and long-tubed flowers. The calyx is over an inch long, five-lobed, split on one side, and the cylindrical corolla tube is five inches long, the limb three inches across and formed of ten oblong segments. The color of the flower is rosy salmon. I have compared a fresh flower of this so-called hybrid with *T. mollissima*,

by Mr. Robert Templeman, of Cape Town, in 1887, and named by Mr. Baker, who describes it as having linear, rigid, erect leaves, two feet long, and a tall, branched scape of bright red funnel-shaped flowers, over an inch long, with spreading segments. Corms of this plant have lately been sent to Kew by Mr. Templeman. The leaves are similar in texture and form to those of *Sparaxis pulcherrima*, now called *Dierama*. The corms are remarkable in being persistent—that is, the old corm, instead of shriveling



Fig. 105.—Roaring Brook Road, Sheffield, Massachusetts.—See page 613.

and find that there is very little difference indeed between them except in color—*T. Smythiana* being a shade darker. *T. mollissima* is an old garden-plant which is sometimes called *T. manicata*, a different species. There is a large specimen of it in the temperate house at Kew, which flowers freely every year. *T. Smythiana* obtained a certificate about six weeks ago.

TRITONIA TEMPLEMANNI.—This is one of the handsomest of the thirty species of *Tritonia* known. It was discovered

and dying away as in *Gladioli*, remains quite firm and healthy, and as a new one is formed every year, the root-stock consists of a number, in some cases more than a dozen, of corms, all packed closely, one on top of the other. The lowermost corms must be a dozen years old. Their appearance is singularly like the droopings of deer.

RICHARDIA AURATA.—This is advertised as a hybrid between *R. albomaculata* and *R. hastata*, raised by Monsieur Deleuil, of Marseilles, and is described as being two feet high,

with hastate foliage, marked with white blotches and well-developed spathes of a beautiful chrome-yellow color. It will have to be very much superior in habit and in the size and color of its spathes to either of its parents, if it is to rival, as some say it does, the two fine yellow kinds named *R. Elliottiana* and *R. Pentlandii*. Still another new Calla, named *R. Nilotica*, is offered by a French nurseryman, and is described as having white and red spathes. The tubers, which were "collected on the banks of the Nile," are quoted at five francs each by M. Letellier, of Caen.

London.

W. Watson.

Cultural Department.

The Formation and Care of Lawns.

AT the late meeting of the New Jersey Horticultural Society, a paper on this subject was read by Mr. George C. Woolson, in which he explained the method of establishing a sward of pure Grass which has been developed by Mr. J. B. Olcott and the Connecticut Experiment Station. Mr. Woolson explained that, no matter how carefully the ground is seeded on the old plan, the weeds will come up more thickly than the Grass, and all the season long much time will be needed in digging out Dock, Plantain, Rib-Grass, Canada-Thistle, and other perennial weeds which will flourish luxuriantly in a soil which has been properly prepared for lawn grass. This preparation of the soil is made by deep and thorough cultivation, so that the roots of the Grass can penetrate in time of drought to damp soil, enriched with well-rotted manure at the rate of forty to fifty tons an acre on poor soil, and a thorough fining of the surface with a short-toothed harrow or a steel rake. The same preparation is needed for the new system which Mr. Woolson proceeded to explain and to illustrate by his own experience, as follows:

A perfectly pure sod of a very fine variety of Rhode Island Bent Grass, *Agrostis alba*, is selected and divided into single plants of one or two spears, and these are set out in rows nine inches apart and nine inches between the rows, or at the rate of sixteen plants to a square yard. These plants are pressed firmly into the soil, and afterward the whole surface is rolled with a hand-roller. All the care required afterward is to keep out every weed, and especially plants of white clover. A small bayonet hoe of a peculiar pattern is used for this purpose. In from three to four months the ground is entirely covered with a short, very thick mass of grass resembling that of a long-piled carpet or fur rug. During the summer an application of from two hundred to four hundred pounds of nitrate of soda to the acre, applied in three or four sowings, will give the plants a fresh start and cause them to assume a bright green hue. If these directions are carefully carried out, there will be no need of weedy lawns and the general complaint that grass cannot be made to grow under the shade of trees.

On the 24th of May, 1891, I set out, along with fifteen other sorts of selected grasses, a patch of the improved Rhode Island Bent Grass, and in three months the plants had spread and grown solidly together, so thickly, in fact, that there was no chance for a weed to obtain a foothold. Again, on the 14th of May, 1892, I set out a larger area, ninety-five feet long and twenty-nine feet wide, which was performed by three men in one day, at a cost not exceeding five dollars. A portion of this last plot was planted under the shade of a large Hickory-tree, with but little expectation that it would do anything more than barely live. In four months, these plants had, in nearly all places, run together and formed a very thick turf of the softest and deepest green I had ever seen, and even under the thickest shade the only difference visible was that here the turf was shorter, showing that the tree had taken from the soil a part of the nourishment provided for the grass. To-day, on examination, I found that the runners of the grass had grown closely up to the trunk of the tree and even in between the large roots which were exposed at the base. This grass, during the past summer, was not cut, and showed but very few flower-stalks. The past summer has been one of unusual dryness, in fact, the driest I have known in twenty-two years, and, as the grass-plot received no artificial watering, it shows conclusively that it will stand a severe drought.

In August I concluded to try another experiment, and so set out a plot of fifteen by nine feet, where from four to six

inches of coal-ashes had been thrown, first, of course, digging the plot over to loosen the mass and the soil below the ashes, which, by the way, was very poor. This plot grew continuously, from the time I set it out, and withstood the hot August and September suns to which it was exposed during the entire day. On September 14, though the drought continued, I set out still another plot, ninety-five by twenty-nine feet, but this time setting the plants six inches apart each way, thinking that they would stand a better chance of living. From September 14 until the latter part of October less than one inch of rain fell, and now the individual plants have grown to a diameter, in many cases, of four to five inches, and should the winter continue open will have nearly covered the ground.

The cost of tending the plot of ninety-five by twenty-nine feet, the past summer, has amounted to not over one dollar per week, while on adjoining plots, sowed with Red Top and Kentucky Blue Grass, the growth of weeds has been enormous and required heavy outlay for labor, and even now there are ten Plantains to every spear of Grass. The whole secret seems to lie in clean cultivation at the outset, as a week's work at that time and a few hours each week for the first summer will accomplish what constant labor could hardly bring about in after years.

Rhode Island Bent Grass, as usually seen, has long runners, with the plants far apart, while in the variety spoken of here the plants cover the entire runners and show no naked stems. Whether this special form of Bent Grass will succeed in California and the southern states remains to be seen, and more extended experiments will be required to settle this. I believe it will pay for farmers to adopt this method of putting down their Grass-fields in some localities where labor is not too expensive. A ready market could be found for pure Grass-seeds at much higher prices than those which now rule. If we wanted a peculiar variety of Rose or Chrysanthemum, Apple, Grape or other fruit or flower, we should not think to perpetuate it by raising it from seeds taken from any of these plants, and we are simply carrying out the same system of grass for our lawns.

I found the action of nitrate of soda beneficial on my own lawn, but any good commercial fertilizer, bone-dust or sheep-manure, will probably do as well, and thus render a top-dressing of stable-manure unnecessary. If the expense of this plan appears too great to warrant the undertaking, it should be remembered that the outlay all comes at the start, and is really less than what is required to make a fair lawn after the first season, while the final results are altogether superior.

Outdoor Cultivation of European Grapes.

IN 1851 Downing said that "the introduction of the foreign Grape into this country for open-vineyard culture is impossible. Thousands of individuals have tried it; the result in every case has been the same—a season or two of promise, then utter failure." It was then believed by our viticulturists that "in the vicissitudes of climate of the North American continent there is something mysteriously hostile to the *Vinifera-vine*."

This opinion had to be modified after the successful cultivation of *V. vinifera* in California, which proved that Downing's judgment might be correct only as it applied to the eastern states. Here the European Vine has persistently failed to thrive. But a few years ago special reasons for this failure were discovered, and not in any mysterious peculiarity of our soil or climate, but in the prevalence of two nearly invisible depredators which are peculiar and native to the eastern regions of North America. One of these foes to the Vine is an insect, *Phylloxera*, or Grape-louse; the other is a fungus, the *Peronospora viticola*, or Grape-leaf mildew.

It will be noticed that since the introduction of these two pests into Europe and into California these regions threaten to become also unfavorable to the open-vineyard culture of the *Vinifera* Grape, and this proves that soil and climate have not all to do with the difficulty in question. In Europe this Vine has flourished in health for hundreds of years, and probably might have continued to do so had it not been for the introduction from America of these enemies. In southern New Jersey twenty years ago all of the varieties of our native Grapes grew and fruited in perfection. It was then thought that here the soil and climate were especially suited to a successful viticulture. These conditions are in no respect altered, and yet now it is evident that all of our so-called hardy native Grapes are doomed to failure in open-vineyard culture unless defended against attack of these pests, which formerly were either unknown or unnoticed.

Fortunately for the future of European viticulture, and of

our own, remedies for both these evils have been found. It is now known that the Phylloxera may be avoided by planting the Vine in very sandy soil, or, in case of the foreign Vines, by grafting them on the roots of such native species as are proved to be resistant to the grape-louse. The mildew may be prevented by spraying the Vine occasionally during the season of its growth with some one of the solutions of copper sulphate. In my practice I have had the best results from use of the Bordeaux mixture, a combination of copper sulphate, lime and water. This mixture, when properly made and applied, is durable, and not readily washed off by rains. In ordinary seasons a Grape-leaf well sprayed in June will visibly retain throughout the summer the protecting chemicals upon its surface.

Where the grape fungi are epidemic, the foreign Vine and the native Vine are about equally susceptible to disease. The foreign varieties seem to be rather more attractive to the fungus germs, and the vine may have the merit of dying perhaps a little sooner under its disorders than some of our native kinds. Either sort will succumb to fungi unless protected. In my vineyard were a number of Vinifera hybrids which nearly all perished from mildew when this became epidemic. Had I not known what ailed them I might have fancied that they failed because they could not endure the climate.

When I began experiments in vine-spraying in 1887, a few specimens of these hybrids were yet dragging out a sickly life, but visibly pining away. Under the administration of the Bordeaux mixture they recovered, and are now growing in apparent health. This experience teaches that we may now hope to grow in open vineyard those European varieties which can endure the temperature of our winters. Father Guicheteau, Principal of the French Catholic College at Vineland, has growing on his farm near Millville, New Jersey, some valuable foreign Grapes, brought from France. These Vines have been persistently sprayed with Bordeaux mixture, and Father Guicheteau informs me that they are growing and fruiting as well as they do in the old country, and have continued this good behavior for three years. But for the protection given them by this spraying, they would ere this have surely perished from mildew. The soil in which they grow is very sandy, and hence they escape the Phylloxera. I shall get some of the wood of these vines and graft them on the roots of my Ironclad Grape, which is proof against the grape-louse. Then I hope to show that to successfully grow the Vinifera Grape in our Atlantic states is not impossible.

The beneficial effect of spraying the vine with the copper solutions can scarcely be realized by those who have not practiced it successfully. Many fail in its use from some error in practice, and the published reports of experiences are yet quite conflicting. For instance, it has been reported that my vineyards are as badly diseased as those which have not been sprayed with the fungicides. The summer of 1892 has been favorable to the growth of the vine, and adverse to the growth of the fungi. Under these conditions, some of those who did not spray their vines secured a partial crop of grapes, and a measurably healthful growth of canes. Hence they argue that "The disease is dying out!" and "all of this bother about fungicides is a humbug, invented by the United States Department of Agriculture as an excuse for the institution of the Division of Vegetable Pathology!"

What may be the effect of another hot and humid summer on vineyards infected by the fungi remains to be seen. Under such conditions I suspect that we shall find it difficult to defend the health of our Vines, no matter whether they are native or foreign.

Vineland, N. J.

Alex. W. Pearson.

Irises and Their Cultivation.—II.

THE rhizomatous Irises are increased readily, and usually rapidly, by division; the bulbous kinds by offsets. Many kinds produce seeds which come true, although some of the species tend to sport. Seeds of some varieties germinate rapidly; others very slowly. In the solid bed of my cool house seedlings of several varieties are now springing up after having been carried a year in seed-pans, and then three months ago thrown out with the earth and given a chance under other conditions. This, by the way, is often a profitable precaution with all seeds of hardy plants which have failed to germinate after one has done his best with them in pans. To secure seed of some kinds it is evidently necessary to fertilize the flowers artificially, and the early-flowering bulbous kinds need protection under glass when in bloom; at least, *Iris reticulata* and similar kinds do not bear seeds when exposed in my garden.

The bulbous Irises require somewhat more care in cultivation than the other section. The conditions, however, are

modified by soil and climate, as is the case with many bulbs. It may be said in a general way that bulbous Irises do well in a good deep, well-drained, rich sandy soil free from humus or manure, and hereabout they should be planted in the warmest part of the garden. Excessive wet in winter seems to be their severest trial. The varieties of these bulbous species are becoming somewhat numerous, but many are still scarce, and experience as to the hardiness of some kinds is very limited. As yet I see no reason to doubt that all, except, perhaps, *I. alata*, can be grown out-of-doors if properly planted. At the same time, the best advice would be to plant the African Irises, *I. juncea*, *I. Tingitana* and *I. alata*, in a cool house. *I. juncea*, which is a variety with beautiful yellow-colored flowers, I have bloomed in the open without protection, but, while it still lives there, it is not to be depended on. Before going further I ought to warn the reader that I make no claim to be an authority on the Iris or its cultivation, and these notes are simply the impressions made on me as I have tried, with more or less success, to flower them, mostly by giving them their own way as nearly as I understood it.

For general garden-culture the varieties of *I. Xiphium* (Spanish Irises) and of *I. xiphoides* (the English Irises) are the most satisfactory, being easily managed, reliable and showy, while the bulbs may be had at an absurdly low rate from the Dutch bulb-growers. My personal preference is for the Spanish Irises on account of their more brilliant colors, but the flowers of the English Irises are larger, and furnish a perfect succession, coming on precisely as the others fade. The foliage of the Spanish Iris appears in early winter, and makes a gradual growth as the season advances, and does not seem to be affected by the hard conditions of that period. The flowers appear on stems about fifteen to eighteen inches high, and are in shades of yellow, brown, blue, white and orange in all quaint combinations. Like all Irises, if cut before unfolding, they may be brought into the house for decoration, and will prove more lasting than if gathered when fully opened. As these fade, the English Irises will unfold with another order of beauty, the colorings being mostly shades of purple and white. The pure white variety of this, *Mont Blanc* of the florists, is a chaste beauty. Varieties of both these groups seed freely, and give flowering plants in two or three years, which will naturally vary from the parent plants.

Before these Irises brighten the garden, however, the amateur in choice plants may enjoy the dwarf bulbous Irises like *I. reticulata*, or similar types. The first to appear is *Iris Bakeriana*, as it is first in beauty and hardiness. The first mild spell after the middle of January will wake it up in this latitude, and one can watch its quiet advance at every loosening of the frost, till it manages to unfold its charms in early February. It seems a marvel that such a fragile, high-colored flower should push its beauties with such audacity in the face of wild winter weather. The Snowdrops and Anemones will close up and seem to shrink while waiting for a better time, but not so this flower. It spreads wide open and frankly asks admiration, and be the weather what it may, it will endure a week of it. As a matter of prudence, however, the gardener should fix a pane of glass over it to guard it from snow or rain. This Iris is a trifle larger than *I. reticulata*, and has glaucous four-sided, channeled leaves (tetragonous the botanists call them), instead of the rounded leaves of the type. The colors vary; mine are a true blue on white, with rich royal purple markings. Next to this will appear *I. histrioides*, which seems to be the largest flower of the group, purplish blue, with dark purple spots and violet markings. *I. Histrio* has not flowered with me; it is said to be very similar to the above. Its bulbs are especially white and handsome.

I. Danfordiæ (Bornmulleri) is a light yellow Iris, which is still a failure here and a warning to me against planting bulbs in wet soil. *I. reticulata* major is an English seedling, with flowers of the same rich colors as the best forms of the type, but it is considerably larger, more vigorous and flowers earlier. The true *I. reticulata*, the little netted Iris, is a charming plant in the border, where it appears, however, to better advantage when grown in fair-sized colonies. It is perfectly hardy, but is improved by occasional lifting, and it may be said that all these bulbs should be examined every year to see that they are in good health. There are numerous forms of *I. reticulata*, the reddish purple being known as *I. Krelagei*, which is not attractive. The bluer forms are *Cœrulea*, *Cyanea* and *Sophonensis*, and Herr Leichtlin offers a few others quite unknown as yet in most gardens. *I. reticulata* forces very readily and does not mind a greenhouse temperature. In this situation its violet-like fragrance can be most thoroughly enjoyed.

Elizabeth, N. J.

F. N. Gerard.

Bacterial Disease of Beans.

ABOUT a year ago my attention was called to a disease of beans by a large commercial seed-house in the west. Samples of the affected beans were carefully examined, and only bacteria were found associated with the trouble. When planted, such beans quickly decayed, an occasional one only developing into a sickly plant. Previous to this a peculiar spotting of the pods of Lima Beans had been observed, and with this, too, only bacteria could be found, the leaflets at the same time showing large discolored blotches, which soon became brown and lifeless. While at the New York State Station at Geneva, Professor Beach called my attention to the same spotting and decay of pods and leaves of the common field beans, and informed me that he could attribute the work to nothing else than bacteria. Since then, during the fall months, visits have been made to large Bean-fields in New Jersey and Pennsylvania, with the result that this decay is found, not only wide-spread among beans, but common to all sorts, both bush and climbing, and in some places it ruins the crop.

From samples gathered upon one of these visits, the accompanying illustration has been made. The diseased spots show less plainly than in the real pods, because the contrast in color between them and healthy tissue is but slight. It was an easy matter to prove by inoculation that the decay of the Wax Beans is the same as that upon the Limas.

One of the most dangerous features in connection with this disease is that the germs are carried over from one season to another in the beans themselves. If it were possible to detect and thereby reject all affected seed, it would make matters easier. Many seeds are worthless at harvest-time, but others are only slightly infested, and it is these latter that do the most mischief. Great care should be taken with the beans used for seed; only the very best should be planted, and, if possible, purchases should be made of those who have not had any bacterial trouble in the field.

There is only one other Bean disease that might be mistaken for this, namely, the "pod spot," and this can be distinguished by its making deep pits, which are pinkish with spore-bearing pimples.

Rutgers College.

Byron D. Halsted.

The Propagation of Hardy Plants.

THE approach of another year reminds us that next summer's display depends largely on what is done now, while outdoor work is suspended. In every garden there is always more or less propagating to be done, whether by means of seeds, cuttings or grafting, and the next three months is the best time of the year to forward the work, more especially as we have now complete control of the temperature and atmosphere. Longer and hotter days means more air in the greenhouse and less moisture, and propagators well know how quickly cuttings wilt unless properly shaded and kept moist. Again, young plants started now gain strength with the advancing year and are in a good condition to set out when the proper season comes, and will, in many cases, flower this year.

We have just been grafting *Clematis paniculata*. The operation is simple enough, all that is needed being to splice the cion on the roots of another species, preferably *C. stans* or *C. Virginiana*. These are potted and plunged in a frame in the greenhouse, and they will start to grow in two weeks, and all will flower this year equally as well as seedlings three years old. Young grafted plants of this *Clematis* make excellent pot-plants when trained to stakes, for they flower from every leaf the plant makes, even from the level of the soil.

Perhaps the best way to propagate hybrid Roses is to obtain roots from some vigorous-growing species, such as *Rosa setigera* (the Prairie Rose), or *Rosa canina*, so much used in Europe as a stock for budding. Last year we took these roots and cut them in three-inch lengths and spliced single eyes of hybrid kinds on them. The kinds used were Ulrich Brunner, Heinrich Schultheis and Mrs. J. Laing. The first made growths

five feet long last summer, and the other sorts did almost as well, and they are the best plants we have now, out of several hundreds, for winter forcing. Cuttings taken at the same time and treated similarly are not more than half as vigorous as the grafted plants, and we experience no difficulty from suckers from the Brier roots as we do in plants budded in the orthodox way, for we take care to match the roots and the cion, using both of the same size, and it is difficult now to see where the union was effected, and there is no other way that I know whereby plants can be obtained of such strength in less than a year.

Those who wish to increase their stock of *Anemone Japonica* can readily do so now by cutting the roots in pieces, three inches long, and placing them in sand in a warm house. When they begin to grow, in a few weeks they may be potted up singly, and, later on, planted out. They will all flower this year if treated liberally as to soil and moisture, for this *Anemone* loves moisture, as all know who have grown it in pots for autumn decoration. In Massachusetts we lose half the flowers by frost when grown in the open ground. Seeds of



Fig. 106.—Pods of Beans showing Bacterial Disease.

perennials should all be sown as soon as obtainable now, as many, indeed most of them, take longer to germinate than the seeds of annuals do, and if the sowing is delayed until late in spring, a whole year is often lost in obtaining flowers. The one error of all others that is most common in seed-sowing, is that of sowing too thick. The plants either damp off wholesale in the seed-boxes when small, or, if they live, grow weak for want of space to develop perfectly, and when transplanted the loss is often great. It is far better to sow just as much as one can take care of properly. Plants, which have been stored for winter propagation, such as Phlox, Helianthus, Hardy Pinks, or others that are propagated from cuttings, should be encouraged to grow now and the cuttings should be taken as soon as possible, as they will root much more readily at this season than they will later.

South Lancaster, Mass.

E. O. Orpet.

Tagetes signata.—Among plants whose beauty is often overlooked because they are cheap and common is the delicate dwarf Marigold, known in seedsmen's catalogues as *Tagetes signata pumila*. Like other Marigolds, it is of the easiest culture, and becomes a compact bushy plant with finely cut leaves, yielding abundantly, and for a long time, its bright orange-yellow flowers, an inch in diameter. After giving a brilliant coloring to the garden for six weeks or more during the early autumn, a few of the plants, when heavy frosts appeared, were potted for indoor use. They appeared not to suffer from the change in the least, and continued to brighten our rooms for several weeks longer, although receiving very little care, and placed at a considerable distance from the windows. The delicacy of its foliage and the warm glow of its profuse bloom, together with its not unpleasant odor, made a most agreeable impression, so that the Marigold was the subject of even more comment and admiration than was its distant aristocratic relative, the *Chrysanthemum*.

State College of Kentucky.

C. W. Mathews.

Imantophyllum miniatum is one of the best plants for window gardens, yet it is seldom seen outside of greenhouses, probably because its merits are not more fully known. It has fleshy roots, Amaryllis-like flowers, and with us it commenced to bloom in October. The first flowers open near the ground and are nearly hid by the profusion of sword-shaped lustrous dark green leaves, some of them two feet in length, which surround the scape. Gradually the flower-stalk increases in height and is now eighteen inches long. It is crowned with nine large blossoms, which are a beautiful shade of salmon-pink. They are delicately fragrant, reminding one of the odor of Chinese Azalea. The plant has many buds still to open and it is in bloom quite three months of the year. The six petals of the flowers are alternately wide and narrow, and the interior of the flower-cup is a light lemon-yellow. These flowers are followed by ornamental bulbiform fruits, which do not often come to perfection under cultivation. Our specimen is on a stand close to a south window, where it gets some sun on every fine day, but is partially shaded by other plants. It has now sent up a new plant from a bulblet, which we shall separate and repot in the spring. *Imantophyllum* does not seem to require any rest and increases in beauty throughout the year. It needs abundant water and a rich compost of well-rotted manure and woods' earth.

Rose Brake, W. Va.

Danske Dandridge.

Correspondence.

The Black Knot.

To the Editor of GARDEN AND FOREST:

Sir,—The passage of a law in New York state to enforce the eradication of the black knot that infests Plum and Cherry trees is notable mainly for its excellent purpose. The law is too circuitous to be easily enforced. On a petition of five freeholders a commission may be appointed, with power to act, in any town. But it will rarely occur that five complainants and petitioners will appear. It will hardly be worth while for one town to be stringent in the clearance of the pest so long as it grows freely in the adjoining township.

I have found but little difficulty in keeping my trees clear, except that it constantly reappears on that side of my land adjacent to a very slovenly kept orchard and lawns. From this side the spores enter my grounds and keep up constant warfare.

There is great difference in the susceptibility of different varieties of Plum-trees to this disease. Bleecker's Gage, or Lombard, and the old English Horse Plum, or Large Damson, a plum now seldom found, and Magnum Bonum are peculiarly susceptible. Shropshire Damson, Washington, Coe, Bradshaw, Reine Claude are among those very little susceptible. Green Gage may be classed midway between the others named. I have found it possible by watchful care and cutting to keep all varieties in good order except the Horse Plum and Bleecker's Gage. These I find it necessary to cut down after a few years, and replace with young trees. But as both varieties are very rapid growers, this is not a serious inconvenience.

Three years ago a form of the knot appeared on my native Bird Cherries, used as ornamental lawn-trees. The nature of the knot in these cases is longer, and folds in the whole twig or limb. It is far more difficult to cut away. In the case of the Plum-trees I send a trained man over my trees in the spring, and again as soon as the crop is removed in summer. He cuts knots out, and, if needful, cuts off limbs. His instructions are to cut smooth, and two inches above and below a knot, as

far as the black line appears under the softer layers of wood. But the damage to my lawn Cherries is disastrous.

Persistent care will surely keep a Plum-orchard in excellent health. I have one hundred bearing trees, and am willing to offer a reward for every knot found uncut. Our plum crop is in great demand, and generally very remunerative. Whether any law can be devised to take the place of public intelligence and foresight is doubtful. One thing is certain, we must educate ourselves to a thorough understanding of our fungous and insect foes, or be beaten in the strife, whatever our laws may be.

Clinton, N. Y.

E. P. Powell.

The Spirit of the California Fruit-growers.

To the Editor of GARDEN AND FOREST:

Sir,—The annual conventions of the California fruit-growers are always interesting and important. From 250 to 500 of the thirteen or fourteen thousand orchardists of the state assemble and devote a week to reports and discussions. Two such conventions are held each year, each time in a different district; a monthly meeting takes place in San Francisco, and one in Los Angeles; and the fruit-growers also have county, township and small district societies or clubs. The entire body of fruit-growers is registered, and its effective organization extends to every part of California.

In the recent convention the high literary quality of many of the papers read, was very noticeable. University graduates, ex-bankers, retired merchants and professional men of the first rank who have taken up fruit-culture as a life-work, are fully capable of going straight to the mark. Every great convention of the horticulturists here is characterized by thoughtful addresses, which are masterpieces in their way, full of special knowledge, and always practical.

One of the best fruit-growers said to me recently, "We, who raise the fruit, are trying, at any cost, whatever looks feasible, and we report to each other. We want more science of the higher kind, no matter how many years or how many dollars it takes, and we will advocate every expenditure on the part of the state and the higher institutions of learning. We want to educate men of science here, we want to support them when they come, though the results cannot be measured in dollars and cents."

There are many of the leaders of the conventions who have taken up the business in this broader spirit. They not only discuss prices and markets, stocks, varieties, and the constantly multiplying details of horticulture, but they appeal to the higher intelligence of their class, and point out the larger relations of the problems involved. The fruit-growers, for instance, are becoming a unit in favor of the maintenance and protection of the forests, and the last convention recommended the passage of Senator Paddock's bill. To quote from the opening address of President Elwood Cooper, of Santa Barbara, if the fruit-growers continue to maintain an "unselfish interest in the general welfare," they will "eventually become a controlling interest in state affairs." "While our especial purpose," he says, "is to interchange ideas, and discuss fruit problems, we are developing other interests, and effecting more important results than even the successful culture of fruits." This spirit, which pervaded many of the convention addresses, appears to me full of happy promise. It really makes very little difference to California's permanent interests whether she takes a few more or a few less of the coming Chicago honors, but it makes all the difference in the world whether the informing spirit of her horticulture fosters higher science and the nobler interest of the commonwealth.

Illustrative of the practical side of the recent convention's work I mention the following items: The fruit-growers asked the state to appropriate \$20,000, to be spent during four years in experimenting with all the obtainable species of friendly insects that will hold in check or destroy the enemies of plant-life. The convention discussed this subject, and every phase of the long difficult fight against injurious insects; it discussed markets, and fruit-unions, in many forms; it suggested the need of a permanent Commissioner of Horticultural statistics; it even took up the ten-block system of numbering country houses and farms, which originated in Contra Costa County and is a great convenience to all concerned. There was talk about roads, village improvement clubs, gardens, and many other topics, treated briefly and well. There were also excursions to particular orchards, to see the methods of management.

The one fact upon which I wish to put emphasis is that these California conventions are growing in importance to the community at large. They have increased in size every

year, but they have gained even more in "average ability" of their members and in dignity of behavior. Their committees are eminently able in these days to urge desired reforms upon legislatures and changes in freight-rates upon railroad companies. The politicians of the cheaper sort are beginning to be afraid of the fruit-growers, who come straight from their orchards twice a year, often with their wives to help, and sit in council with members from every other district in the state.

Berkeley, Cal.

Charles Howard Shinn.

Early and Late Strawberries.

To the Editor of GARDEN AND FOREST:

Sir,—The account of Mr. Blacknall, on page 570, in his efforts to get the ideal early Strawberry by cross-fertilization, recalls my efforts to obtain a late Strawberry by the same methods. Until a few years ago, only the very largest of Maine strawberry-growers shipped their crops to Boston and New York, and even now this industry is young and growing slowly because of irregular shipments, high commissions, and the damage to the fruit in transit.

The season for cheap strawberries in New York and Boston begins about May 15, and extends to July 4, after which raspberries and blackberries are in the market. In Maine, however, our Wilson Strawberries begin to ripen about June 20, and the Sharpless on July 4, so that we have strawberries from the vine as late as July 15. I find that by setting plants in low, mucky land, covering them deeply with straw and brush, and keeping them covered until June 1, or later, the ripening can be delayed until nearly August 1, when I have a monopoly of the big cities.

What we need here is a late, rank-growing, hardy plant, with fruit the size of the Sharpless, the color and firmness of Wilson's Albany, and as prolific as the Crescent. In my efforts to get such a plant, I have moved fully 2,000 seedlings, and of these I am wintering but seventeen. It is a slow, hard task. The rank-growing plants, as a rule, are not hardy, while the dwarf varieties are too early for my use. A type that is almost perfect when in pots takes to sporting and goes back to its original form as soon as set out in the ground. And so I have thrown away my pets one by one until not a score remain. Meanwhile, I shall keep crossing and experimenting until I get the right kind, after which Mr. Blacknall's earliest and my latest will furnish the people of New York, Philadelphia and Boston with cheap strawberries for six months every year.

Brewer, Me.

H. A. Eaton.

Desecration of Natural Beauty.

To the Editor of GARDEN AND FOREST:

Sir,—I wish to thank you for the editorial article on the Defacement of Scenery, which appeared in a recent issue of your paper. Thoughtful persons have long noted and deplored the rapid destruction of the landscape beauty which the slow processes of nature have been unfolding through centuries of growth and change, but they have kept silent because protest seemed useless. It seems now that the desecration of high, if not of holy, places, by the paint-brush of the advertiser, has awakened some indignation; and if this indignation has found a louder expression than that which has been called forth by the blasting work of the railroad, the oil-well, the charcoal-furnace or the mine, it is only because there seems some hope of redress in the first case, while the widespread desolation from other causes has appeared to be the costly, but inevitable, sacrifices which the spirit, or the demon, of material progress demands.

Your suggestion that our heritage, the beauty of the world, is a trust for coming generations, places the matter on its proper footing. "Man cannot live by bread alone," and the material prosperity gained by the destruction of pure and noble forms of beauty may prove in the end a national calamity. It certainly will be such a calamity if it is true that landscape beauty is a vital necessity to the mental and spiritual health of a people. In a thoroughly enlightened society the conservation of natural beauty would be regarded as a national duty just as truly as the protection and development of any other natural resource which makes for the public wealth or health—an obligation as binding as that which leads a government to keep its river channels clear or its harbors safe or its forests productive. Governments build libraries and establish universities and galleries of art to cultivate men's higher nature. They have no right to permit the destruction of what the Almighty has already prepared to serve the same high purpose.

Orange, N. J.

H. M. A.

New Cyripediums.

To the Editor of GARDEN AND FOREST:

Sir,—The following hybrid Cyripediums have recently flowered for the first time at the United States Nurseries, Short Hills, New Jersey:

CYRIPEDIUM BARTETI ANGUSTUM.—This distinct variety was obtained by crossing *C. barbatum* Warnerii with *C. Insigne* Kimballianum. Growth very compact; leaves narrow, three to four inches long, pointed. The dorsal sepal long, narrow, yellowish green at the base, shaded and spotted with brown; petals narrow, purplish at the ends; lip long and narrow, shaded heavily with brown.

CYRIPEDIUM NIOBE SHORTHILLENSE.—A beautiful and distinct variety of a great merit; flower large, well-proportioned, having the vinous purple lines reaching nearly the top of the dorsal sepal, and washed over on the sides; the yellowish green portion in the lower part is also much brighter. The sepals and the lip are very dark, brown-purple, with a broad mid-vein of vinous purple through the petals.

CYRIPEDIUM NIOBE MAGNIFICUM.—Differs from the type in its large dorsal sepal, which is pure white with the exception of the purplish line through the middle, and the brown and green portion in the lower part, as in *C. Spicerianum*. The sepals and the lip large, color the same as the type.

Short Hills, N. J.

Joseph Manda, Jr.

Plantago media.

To the Editor of GARDEN AND FOREST:

Sir,—It may be of interest to some of your readers to know that the Plantain mentioned in your issue of November 16th, page 550 (*Plantago media*), has been growing in Providence for at least three seasons. It was collected by me in 1890, and specimens of that date are in Brown University Herbarium. I secured a few more specimens at the same station last June.

If memory serves me correctly, one of our local collectors obtained specimens of this same Plantain in 1890, and I had always supposed he sent specimens to Harvard Herbarium at that time until I read the letter in your columns.

Providence, R. I.

J. Franklin Collins.

Meetings of Societies.

The Kansas State Horticultural Society.

THE twenty-sixth annual meeting of this society was held at Winfield, which is in Cowley County, one of the southern tier of Kansas counties, just east of the Arkansas River. It is one of the best fruit-growing regions of the state, and its productive capacity is only just beginning to be understood. Some of the leading points brought out in the papers and discussions are herewith given:

APPLE ORCHARDS.—For the eastern and northern portion of the state the uplands were considered preferable to bottom-lands for orchard purposes, and northern and eastern exposures were recommended, since the trees in such locations are less subject to sun-scald and the influence of heated winds during the drier months. In the Arkansas valley, on the contrary, the bottom-lands were recommended for orchards, there being along the Arkansas River and its tributaries much land where the sub-flow water is reached at a depth of only a few feet. It was believed that Apple-tree-roots penetrated deep enough to drink this moisture, and growth was, therefore, much greater and the trees longer-lived. Thorough and deep preparation of the soil was advised, and where the subsoil is of a stiff, refractory character, such as is found underlying much of the prairie country, the use of the subsoil-plow found many advocates. The too common practice of setting the tree in a hole dug in the hard ground, instead of loosening up the whole area, was believed to cause the early death of many young trees. The discussions brought out the fact that several large commercial orchards had been planted in this section, one of over 600 acres in Greenwood County ranking second only to the great Wellhouse orchard of Leavenworth County, with its 75,000 trees. Growers in the eastern counties have in years past found a considerable market in the western portions of the state, but their sales are cut off more and more each year by the crop from younger orchards further west. First the home-demand is supplied, and then the fruit finds its way to the west, till there are now few localities in the eastern half of the state not supplied with home-grown fruit in a favorable year, and a partial supply is grown well out to the one-

hundredth meridian. There seemed to be little apprehension, however, as to markets for Kansas apples. The north-west states and the mining regions of the mountains will long make a good demand, and it was pointed out that there is a growing inquiry in the south for long-keeping winter apples.

THE BEST VARIETIES.—Ben Davis seemed to stand first in the esteem of market-growers as an apple for profit. The free growth of the tree, its hardiness and abundant yield of large and handsome fruit are strong points in its favor. Missouri Pippin ranked a good second, as it comes into bearing early and yields enormously. Gano and York Imperial are being planted largely, but the test of time is needed before growers will plant orchards of these sorts with the same confidence which they feel in the two first-named. Duchess of Oldenberg was mentioned favorably for its extreme earliness, being the first on the Chicago market. Keswic Codlin, a later apple, was regarded as worthy of more attention. Jonathan and Wealthy were considered profitable late autumn sorts, although they did not carry far into cold weather.

THE YEAR'S YIELD.—From the fruit reports it was evident that such a general failure had never been known before of apples, pears and peaches. Except in an orchard here and there, in some exceptionally favored and sheltered locality, nothing like a crop was produced. Although in nearly every section of the state the bloom was abundant and a full crop often set, nearly all the fruit dropped before it reached any size. The scab prevailed to an extent heretofore unknown, and the consequent loss of foliage in most cases was great and ruinous. By those who had given the subject the most careful study it was believed that the premature dropping of so much fruit was due to the low vitality caused by this disease. More of Rawles' Janet apples were produced than of any other sort. This variety blooms later than the average and seemed in a measure to escape the unfavorable weather. In one county a young orchard of Canada Pippins, or White Pippins, had borne a handsome crop and proved very profitable. Plums and cherries, except in a few cases, had failed. The short strawberry crop suggested the rejection of varieties with soft, watery berries, and the Robinson, a Kansas seedling, was recommended by a good authority as the best all-around berry. Blackberries in the eastern counties gave a full crop; further west they failed. Snyder seemed to be the favorite sort. Of black Raspberries, Nemaha, Progress, Palmer and the Kansas were commended by shippers, while Souhegan was a general favorite for near markets and home use. Thwack and Cuthbert were the favorite red varieties, but this fruit is not very generally grown. Gooseberries, to the few who had tried them, gave good returns, and Currants, when in a cool place, sheltered on the south, yielded well. Grapes were nearly a full crop and the quality was unusually good.

IRRIGATION.—For the central and western counties the use of water, wherever available, from spring, reservoir or wind-pump, was advocated by the most enterprising gardeners, to tide over periods of drought. The fact was pointed out that, in many counties, there are numerous springs running to waste, and often injuring the land below them, where, if properly piped and distributed, they might bring a handsome income from vegetables and small fruits. Celery, which is only profitable when grown as a late crop, so that it can make its growth after the dry, hot season, can be successfully cultivated with partial irrigation. It is now grown in this way to a considerable extent, and the home product easily holds the market against that from Kalamazoo. One grower, by the way, whose young plants had been largely destroyed by the tarnished plant-bug, had succeeded in routing the enemy with a very strong kerosene emulsion. This was found to destroy many of the plants, which rotted at the heart. Later on he discovered that injury from the emulsion could be prevented by turning a hose on his plants and washing them freely with clear water.

GROWING POTATOES.—An interesting fact was presented in a report upon potato-culture, as to the value for seed of potatoes grown as a second crop. As ordinarily planted here, the potato matures in July or August, and is apt to sprout and make second growth, as it has a long season yet to lie in the ground or in a warm cellar before cold weather. Such potatoes come out in the spring soft and shriveled from much sprouting, and lack the vitality necessary to a vigorous growth. By planting early sorts, they may be dug in July, and, after a few days' exposure to the light, can be planted for a second crop. It is recommended not to cut them for this purpose. This second crop is left in the ground as late as possible, and yet escapes freezing. While the crop is usually light, the quality is remarkably fine, and these tubers come out in the spring as

firm and free from sprouts as when put in the cellar. Planted by the side of ordinary seed, the difference in vigor and yield is remarkable, the unusually high percentage of choice table potatoes being a great inducement to the market-grower.

A discussion of this paper revealed the fact that this method of growing seed had been followed in a quiet way by several old gardeners in the state for some time, and that the Experiment Station had the report of three years' work in this line ready for the press. Of course, the idea was not new, but the application of it to Kansas gardening was a revelation to many.

THE PROPAGATION OF TREES.—Under the subject of methods of propagation a veteran nurseryman exhibited two-year-old Ben Davis trees worked on pieces of seedling-roots of various length, with samples of the grafts as made. There were whole-root grafts so long as to require a deep trench to set them in, and "piece roots" in sizes down to an inch in length. The sample trees showed little difference resulting from these different methods, all being furnished with abundant roots from the cion, and making a tree practically on its own roots. The best trees shown were from cions eighteen inches long grafted on pieces of root two inches long. Here the additional foliage secured at the start seemed to excite more vigorous root-growth, and a strong, well-balanced tree of unusual strength, both of root and top, was the result. A special committee, appointed to report upon methods of propagation, gave it as their opinion that no advantage, but rather a positive detriment, resulted from the use of whole root-stocks for Apple-trees, and the practice of certain nursery companies in selling such trees to uninformed persons at exorbitant prices was severely condemned.

How to beautify the farmer's home and surroundings was one of the subjects debated, and a very careful study of plans for remodeling old homes was presented by Professor J. D. Walters, of the Agricultural College, who showed that in the hurry of opening up a new farm in the west the buildings are too often placed here or there with little thought as to a general plan or the convenient and tasteful arrangement of the whole. Some possibilities in rearrangement and the bold strokes often necessary to get unsightly barns and yards back from the road were very graphically set forth in this paper.

Manhattan, Kan.

S. C. M.

Recent Publications.

Short Studies in Botany for Children. By Harriet C. Cooper. New York: Thomas L. Crowell & Co.

Each one of the thirteen chapters in this little book is devoted to a description of one of the natural orders of plants; that is, the principal characters of the Mint family, the Pine family, the Pulse family and the rest are explained in simple but accurate language, so that a bright child who goes through these pages, under the direction of some careful teacher, will acquire a considerable rudimentary knowledge of botanical science. The best way to begin the study of botany is to study the plants themselves, and this book will be helpful, so far as it is used in connection with living or dried specimens, to encourage original investigation. It may be questioned whether the shadowy persons who carry on the dialogues in the book add much to its interest. The real plants need no accompaniment of fictitious little girls who are little more than empty names. But the merit of the book is, that the descriptions are precise, and the points of fundamental resemblance which unite the various genera into families are carefully brought out and are treated in such a way as to suggest the most useful lines of study.

Old Concord: Her Highways and Byways. By Margaret Sidney. Boston: D. Lothrop Company.

This is a new and enlarged edition of a book published four years ago, and the fifty or more illustrations of points of historic interest which it contains, give an attractive view of the more striking features of the old town. The gossipy text hardly equals in merit the pictures, many of which have a genuine artistic value; but very little that is novel or fresh can now be written of Concord. Scenes once described by Hawthorne or Thoreau can hardly be depicted more vividly by other pens. But one never tires of reading of the famous old town, with its memories of Revolutionary times and its homes of great thinkers in later days, and this beautiful volume cannot fail to bring genuine pleasure to those who have visited Concord, by reviving memories that slumber, and to those who have never trodden its historic highways and byways, by giving them a clearer idea of its appearance and suggestions of its singular charm.

Notes.

The Irish Land Commission is planting large numbers of forest-trees on the west coast of Ireland.

The Ice Crop is the title of a little book published by the Orange Judd Co. which gives explicit instructions for cutting, storing and handling ice, the construction of houses for refrigerating and cold houses for keeping fruits and other perishable substances. It contains 114 pages and is profusely illustrated.

Belgium has two Government establishments where horticulture is taught, one at Ghent, with an average attendance of forty-four pupils, and one at Vilvorde, with an average of thirty-eight, and besides these the Government subsidizes six other institutions in which tuition is given and experiments in horticulture are carried on.

On the fringe of the Colorado desert, near the old railroad station of Seven Palms, horticulturists have proved that the production of early fruits is possible. This year oranges from this place were in market as early as the 20th of November, while figs, pears, apricots, small fruits and vegetables ripened especially early.

The order for a forest-reservation in San Bernardino County, California, which will protect the watershed of the Sierras for fifty miles, is giving delight to the horticulturists of southern California. The new reservation includes the sources of all the large irrigation systems of that part of the state, and hereafter the Sheep-men will be prevented from starting fires in the protecting forest.

One is rather surprised to find Yuccas in bloom out-of-doors in the last days of December, but visitors to Central Park have been favored with such a spectacle this year. The plants that have flowered are labeled *Yucca recurva*, but look as if they might be some form of *Yucca gloriosa*. The cluster of long green leaves, without any filaments, starts from the summit of a stem about two feet high, and the flowers, although they look rather limpy and unhappy in the frosty air, are fairly well opened.

At Walter's Station, on the Southern Pacific Railroad, in the desert, a hundred miles west of Yuma, a boring of five hundred feet has found a supply of artesian water, which rushes to the surface with a strong flow. It is all that could be desired in clearness, coldness and quantity, and, if the flow proves permanent, this will mean that the desert is to blossom like the Rose. These arid lands, although at present worthless, are rich in the elements of plant-food, and only need water to produce abundant orchard and field crops.

In a recent description of Penrhyn Castle and its grounds, in North Wales, it is said that many plants, which are usually grown in greenhouses, are standing in sheltered nooks about the castle, where they flourish with but little protection. Among them are *Agapanthus umbellatus*, *Lapageria rosea* and a huge Bamboo, *Arundinaria falcata*. It might be supposed that, in such a favored spot, Palms, which flourish in northern China, would be at home, and, as a matter of fact, a magnificent pair of *Chamærops Fortunei* has stood out for years.

In speaking of the Globe flowers, the London *Garden* says, that occasionally, in England, old-established plants give a few flowers in September and October. We have found that it is the general habit of the Mountain Globe flower (*Trollius Europæus*) to bloom with some freedom through the late autumn months, when the bright yellow globes, an inch or so in diameter, are very attractive. These Globe flowers deserve a more prominent place than has been given to them in our hardy gardens. Their roots like a cool, well-drained soil, but one where moisture can be reached.

Since the latter part of November, Mandarin oranges, grown in Japan, and imported by steamer, have been selling by the wagon-load on the streets of San Francisco at ten cents a dozen. The fruit is fair, not fully ripe, but palatable and easily prepared for eating. The very best of these oranges are carefully wrapped, singly, in strong white paper, upon which is printed, in legible English, "This is a genuine Mandarin orange, imported direct from Japan. Any persons wishing to obtain the trees from which such oranges are grown, may apply to —". This shows a shrewdness in advertising which may give a hint even to Yankee enterprise.

A correspondent of the *Gardeners' Chronicle* notes the fact that this year has passed without the celebration of the cente-

nary of the *Camellia*, which, although it had been introduced earlier, flowered for the first time in Europe in 1792. It is also suggested as a matter worthy of historical research that some one should find out how long the various single-flowered varieties were in cultivation before the first double flowers appeared. It is only a few years since the Bolivian *Begonia* and its allied species were introduced and double-flowered tuberous varieties began to appear as if by magic. On the other hand, the Persian *Cyclamen* has been generally cultivated for a much longer period, and yet we rarely see a plant which bears double flowers.

Rev. C. Wooley Dod writes to the *Gardeners' Chronicle* that having noticed among some plants of *Chrysanthemum maximum* a seedling with abnormal leaves and habit he potted it to flower in the greenhouse. It has now produced a yellow flower new to the writer, and he infers, with some reason, that the plant is a hybrid between *C. maximum* and *Anthemis tinctoria*, as these two plants were near together. Mr. Dod adds that in his garden, where accidental seedlings are usually allowed to flower where they come up, spontaneous hybrids between distinct species are of common occurrence. If this new plant is a hybrid between members of different genera it is the second probable case of the kind in Mr. Dod's garden, the first having been a supposed hybrid between *Chionodoxa Lucilliae* and *Scilla bifolia*.

We are glad to know that a report on Nuts and Nut-growing is in course of preparation by the Department of Agriculture, under the direction of Mr. H. E. Van Deman, the pomologist. Several very large Chestnuts have, within a few years, been brought before the public, among them the Ridgely, which originated near Dover, Delaware, and was once thought to be an American variety or cross between our native Chestnut and the European. Mr. Van Deman is convinced, however, that this is a seedling of purely foreign stock, just as Paragon and Numbo are. These three kinds bear while very young, and they bear abundantly, and although the flavor is not equal to our own wild Chestnuts, they are very good when cooked. It is to be hoped that more attention will be given to varieties of our native Chestnuts that are particularly large-sized, so that, by careful selection and propagation, we can have Chestnuts which, in addition to considerable size, will have the unequaled flavor of our native nuts.

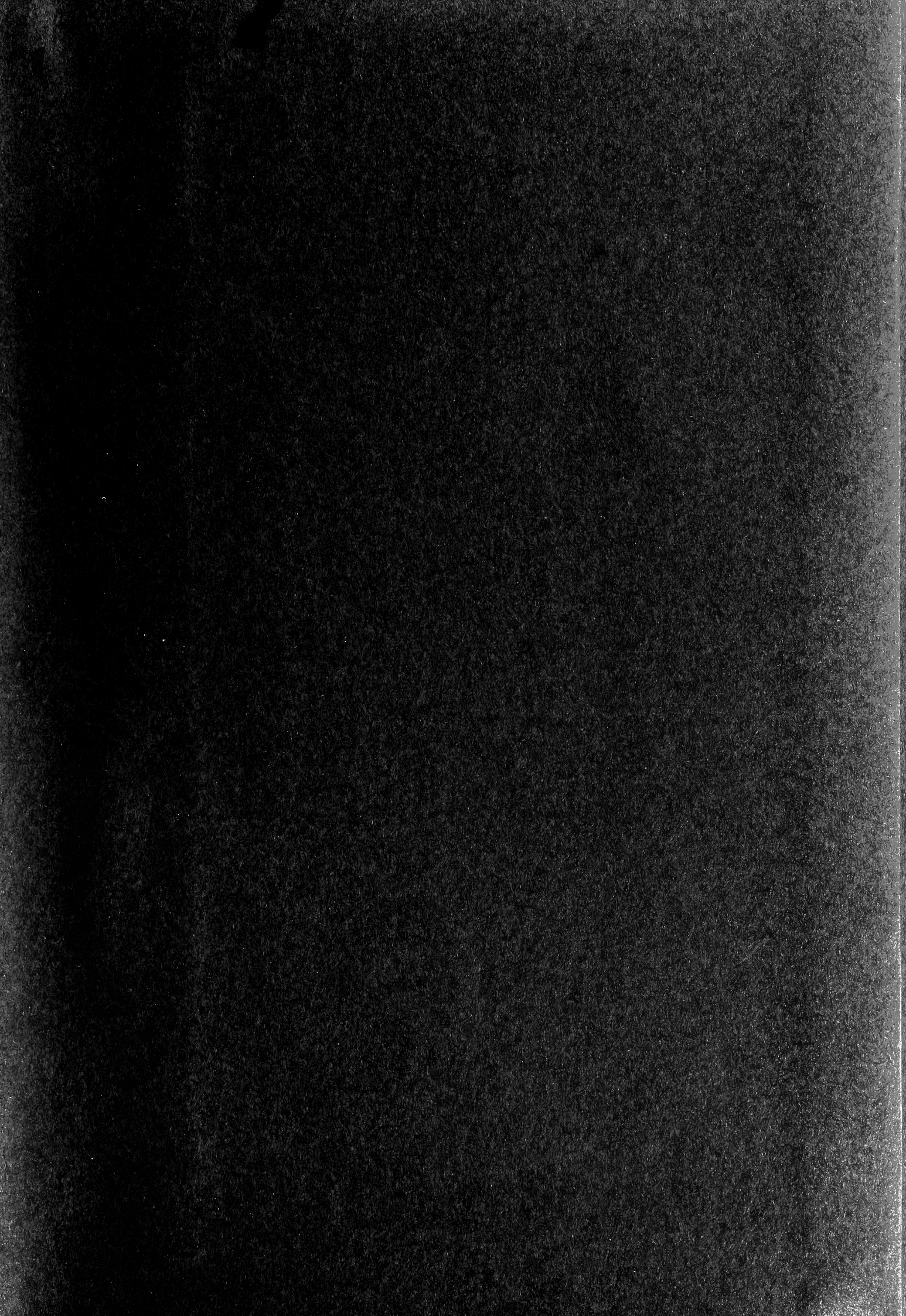
In the issue of *The Tribune*, of this city, for December 25th, Professor Charles H. Peck, of Albany, Botanist of the State of New York, gives some account of a Mushroom which he pronounces a new species. This Mushroom has been cultivated for some time by a market gardener whose place adjoins that of Mr. Charles A. Dana, at Dosoris, Long Island, and Mr. William Falconer, Mr. Dana's gardener, forwarded a specimen to Professor Peck. A few weeks later Mr. Falconer found a specimen on Mr. Dana's grounds, and sent that also, and from an examination of the two, Professor Peck has established a new species which he calls *Agaricus subrufescens*. The stem is thicker toward the base and is generally longer than that of the common Mushroom. The collar about the stem is thicker, and on the under surface is covered with little flocculent scales. The spawn is coarser and more stringy. Its scales are at first white, the cap is grayish white, often with a reddish tinge and obscurely spotted. The merits of the new plant are said to be that it is strong and hardy, and can be profitably raised in the summer; that the Mushrooms appear from ten days to a fortnight sooner after planting the spawn than is the case with the ordinary species.

Catalogues Received.

J. E. BOLLES & Co., 336-342 River Street, Detroit, Mich.; Wrought Iron Fences, Grills, etc.—A. BLANC & Co., Philadelphia, Pa.; Illustrated Catalogue of Rare Cacti, Bulbs and Tubers.—S. W. CALL, Perry, Lake County, Ohio; Fruit and Ornamental Trees, Small Fruits, Vines and Deciduous Shrubs.—JACOB C. CASSEL, 709 Arch Street, Philadelphia, Pa.; Terra Cotta Vases, Hanging Baskets, Rustic Settees, etc.—HERB & WULLE, Naples, Italy; Trade List of Seeds of Flowers, Vegetables, Trees and Shrubs, Flower Bulbs.—THE MAPES FORMULA AND PERUVIAN GUANO Co., 143 Liberty Street, New York; The Mapes Tobacco Manures.—PITCHER & MANDA, United States Nurseries, Short Hills, N. J.; New Importations of Orchids and Cycad Circinalis.—SHERWOOD HALL NURSERY Co., 427-429 Sansome Street, San Francisco, Cal.; Choice Seeds, Bulbs, Roses, Shrubs, Vines and Trees.—JAMES STEWART, Elmwood Nursery, Memphis, Tenn.; Roses, Flowering Shrubs, Shade, Ornamental and Fruit Trees, Small Fruits and Vines.—WEST JERSEY NURSERY Co., Bridgeton, N. J.; Descriptive Catalogue and Wholesale Price List of Fruit and Ornamental Trees, Grapevines, Small Fruits and Flowering Plants, Canada Unbleached Hard Wood Ashes.

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